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OUR AMAZING POPULATION UPSURGE

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THREE is real truth in de Tocqueville's old footnote: "The population of a country assuredly constitutes the first element of its wealth."¹ Though I am skeptical of all forms of fundamentalism, I hold that our most basic national resource is our people.

This week the Census Bureau released its population estimates for July 1, 1949, unadjusted for underenumeration of children in 1940. If we add to this figure, 149,215,000, the official estimate of the required adjustment, 863,000, our "true population" slightly exceeds 150 million, which some textbooks now in use still mention as our probable peak for all time. We may confidently expect the true population on July 1, 1950 to be around 152 million, roughly double that of July 1, 1900.

If the latest official postcensal *estimates* can be fairly trusted, the population of the continental United States (including armed forces overseas) increased in the decade ending July 1, 1949 by 18.3 million, or 14.0 percent.² The corresponding increase in the decade ending July 1, 1950 will surely be larger, in round figures probably at least 19 million, or 14.4 percent.³ This is more than double the absolute increase in the decade ending July 1, 1940 (now estimated at 8,893,000), and double the rate of increase in that

¹ Alexis de Tocqueville, *Democracy in America* (Aldine ed., Appleton, New York, 1899), II, 465. The Second Part, in which this footnote appears, was originally published in 1840.

² Recent monthly figures are given in Bur. Census, *Current Population Reports: Population Estimates*, Series P-25, No. 27, Aug. 19, 1949.

Such figures are based on the best data available on births and deaths, with skilled allowances for under-registration, and on carefully scanned data on in-and out-migration. Though subject to revision after the next census enumeration, as of Apr. 1, 1950, the revisions can hardly be so drastic as to affect the substance of this paper.

³ A UP release of July 31, 1949 on the Census Bureau gave this figure as the officially "expected" increase. *New York Times*, Aug. 1, 1949, p. 20.

prewar decade (7.2 percent). Contrary to confident expectations of a sharp decline in the population increase after the anticipated postwar upsurge of births, the latest reported 12-months net increase (to July 1, 1949), officially estimated at 2,644,000, is only seven percent below the all-time record figure of 2,845,000 in the 12 months ending August 1, 1947.⁴ As of July 1, 1949, the currently estimated population is 1.05 million higher than indicated for that date in the comparable Census Bureau forecast released in mid-February, 1949.⁵

Why is the population upsurge in the 1940's "amazing"?

First, the absolute increase is the largest of any decade in our history. The rate of increase is close to those of 1910-20 and 1920-30, and the rate of natural increase (i.e., excluding the influence of net in-migration) will prove to be of the same order of magnitude as in the two decades centered on 1900.

Second, 1940-50 was a war decade par excellence. In three earlier war decades—1810-20, 1860-70, 1910-20—the rate of population increase declined sharply. Warren Thompson, one of our most respected students of population problems, argued in two books published during the late war "that even under the most favorable conditions . . . war does have a very depressing effect on population growth. . . ." Philip Hauser, now acting director of the Census Bureau, argued this even more strongly and specifically in 1942.⁷

Third, the population developments of 1940-50 were totally unexpected. If, ten or twelve years ago, anyone had dared to predict for 1950 the figures that now seem sure to be reached, with or without the assumption of our involvement in a second world war, he would have been almost universally regarded as irresponsible if not insane. The events have falsified numerous and successive forecasts by those who were widely regarded as dependable

⁴ Registered births in 1948 were only 141,000 below the huge figure of 3,700,000 in 1947, and the birth rate in 1948 was apparently higher than in any year except 1947 since 1918. Through June 1949 there was little decline, and the estimated number of births in January-June 1949 was slightly higher than in the same period of 1948. Federal Security Agency, *Monthly Vital Statistics Bulletin*, Aug. 15, 1949.

⁵ Bur. Census, *Current Population Reports: Population Estimates*, Series P-25, No. 18, Feb. 14, 1949, p. 12.

⁶ W. S. Thompson, *Population Problems* (3d ed., McGraw-Hill, New York and London, 1942), pp. 44-49; W. S. Thompson, *Plenty of People* (Cattell, Lancaster, Pa., 1944), p. 79. In the postwar edition of the latter book (rev. ed., Ronald, New York, 1948), chap. v, Thompson expressed a modified view.

⁷ P. M. Hauser, "The Impact of War on Population and Vital Phenomena," *Am. Jour. Sociol.*, November 1942, XLVIII, 309-322.

experts, after "a vast amount of population study and research." A continuation of the downtrends in rate of population increase, and in fertility rates, had been confidently expected. The events have upset, or at least called seriously in question, a whole series of convictions which social scientists generally had come to hold firmly. I must shortly say more on this third point.

Additional features of the population experience of the 1940's deserve passing mention. The married state has become more common, "single blessedness" much less so. The median age at marriage has declined. The number of families has risen much faster than the population.⁸ The infant-mortality rate has gone on declining, uninterrupted by the war. The maternal death rate, after long showing no clear trend, has declined markedly since the mid-1930's. Life expectancy has continued to increase, with no slackening of pace yet visible; and upper limits formerly suggested have been exceeded or are being approached well in advance of the dates forecast. The death rate in the upper age groups, which earlier was resistant to change, has been falling and bids fair to continue to fall. The increase in children under five in 1940-50 will probably be around 50 percent, and that of people over 65 well above 25 percent. The median age of the population, which rose sharply in the 1930's, has risen very little in the 1940's, and has actually fallen since 1945—if my guesstimates are not disproved by eventually detailed calculations. The crude death rate has continued to decline, despite the rise in the median age ever since 1810. Eventually, as the elderly and aged increase further in proportion to the total, this rate will rise; but no one can safely say how soon. The number of elderly and aged (say 60 and over) has risen rather more than forecast, but the proportion has recently risen much less and may be lower in 1950 than in 1940. The lengthening of life has been accompanied by extension of the period of vigor and potential productivity, altering the significance of the upper age groups.

The upsurge of population in the 1940's, moreover, has been accompanied by important net gains in the level of living. These gains, much greater than in the preceding decade, are beyond question, even though none of the common measures or indicators are trustworthy as to the extent of the improvement, and we have

⁸ Bur. Census, *Current Population Reports: Population Characteristics*, Series P-20, No. 25, Aug. 19, 1949.

yet no reliable over-all index. Indicative but not definitive are the decline in infant-mortality rates, the increase in per capita consumption expenditures deflated by the Consumer Price Index (35 percent between 1929 and 1948), the expansion of services provided at public expense, and a variety of others. If we could use medians instead of arithmetic averages, and make suitable adjustments for the altered age distribution of the population, the gains would show up as even more striking. The phenomenon is the more impressive because 1940-50 was a war decade.

Some Forecasts in Retrospect

Let us see how a few forecasts have stood the test to date. Bear in mind the figures I have already suggested: a true population July 1, 1950 of around 152 million; a 1940-50 increase of at least 19 million; and a 1940-50 rate of increase of about 14.4 percent.

The best forecast of the 1950 population that I have found is P. K. Whelpton's first published in 1928 (*Am. Jour. Sociol.*, Sept. 1928, XXXIV, 253-70). It will be remarkably close to the true figure, though the implied rate of increase in 1940-50 (9.7 percent) will be far below the true one. Ironically, however, Thompson and Whelpton soon abandoned this forecast. The one that they made for the President's Research Committee on Social Trends, published in 1933, and all of their subsequent ones, have been too low, both absolutely and relatively.

Pearl and Reed's 1920 forecast for 1950, with their logistic curve derived from data for 1790-1910, will also be respectably close to the true figure, though probably 3-5 million too low. It has not been disavowed, though their confidence in it was weakened when the 1940 census showed their forecast for that year to be considerably too high.⁹ Here also the implied rate of increase in 1940-50 (9.1 percent) is much too low.

The most influential series of "projections" were made in 1935-36 by Thompson and Whelpton for the highly impressive Committee on Population Problems, and published in its reports to the National Resources Committee, October 1937 and May 1938.¹⁰ The authors gave me the impression that they preferred the projection based on their assumptions of medium mortality, medium fertility,

⁹ *Science*, Nov. 22, 1940, pp. 468-488.

¹⁰ *The Problems of a Changing Population* (Washington, 1938).

and no net in-migration, which we may abbreviate as "*mmO*."¹¹ This pointed to a 1950 population of 140.6 million, a 1940-50 increase of 8,568,000, and a rate of increase of 6.49 percent. These, of course, were far too low. What I took to be their second preference, assuming low fertility instead of medium (*mlO*), indicated a 1950 population of 137.1 million, a 1940-50 increase of 5,776,000, and a rate of increase of 4.4 percent. In retrospect, this appears absurdly too low, but it won more endorsement than criticism at the time.¹² I have recently learned that Whelpton then preferred the *mm100* or *mm200* projection.

The highest projection in this 1937-38 series of six—assuming medium mortality, high fertility, and an average of 100,000 net in-migrants per year (*mh100*)—pointed to a 1950 population of 144.2 million, a 1940-50 increase of 11,751,000, and a rate of increase of 8.87 percent. A still higher projection on the assumptions of low mortality, high fertility, and 200,000 net in-migrants per year (*lh200*), published in the October, 1947 document pointed to 146.8 million in 1950—slightly nearer the truth but still much too low. *In fact, despite war losses, mortality has been below the "low" assumption, in-migrants have averaged over 100,000 per year since 1940, and fertility has been far above the "high" assumption.*

The revised projections which Thompson and Whelpton made in 1941-42 for the National Resources Planning Board, published in August 1943, were little nearer the eventual truth.¹³ They still appeared to lean toward the *mmO* projection, indicating a 1950 population of 143.9 million, a 1940-50 increase of 11,364,000, and a rate of increase of 8.57 percent.¹⁴ The slightly higher projection, which the Twentieth Century Fund chose to use in its magnum opus, *America's Needs and Resources* (1947)—*mhO*, implying "high" fertility instead of "medium"—pointed to a 1950 population of 144.7 million, a 1940-50 increase of 12,174,000, and a rate of increase of 9.19 percent. The highest of the twelve projections given

¹¹ The precise meanings attached to these various assumptions have been changed from time to time, but for the purpose in hand the changes are of minor importance. I prefer the clumsier but more precise term "in-migration" to the commoner but looser one "immigration."

¹² This was evidently the projection on which Hansen relied in his presidential address of December 1938. Alvin H. Hansen, "Economic Progress and Declining Population Growth," *Am. Econ. Rev.*, March 1939, XXIX, 1-15.

¹³ W. S. Thompson and P. K. Whelpton, *Estimates of Future Population in the United States, 1940-2000* (Washington, 1943).

¹⁴ The Bureau of Agricultural Economics evidently relied upon this forecast in its postwar studies published in 1945.

in this 1943 document, on *mh100* assumptions, pointed to a 1950 population of 145.2 million, a 1940-50 increase of 12,674,000, and a rate of increase of 9.56 percent. All of these, moreover, were on the additional assumption of no war losses.

In 1945-46 Whelpton made another series of projections with the aid of the Census Bureau, which the Bureau published in 1947.¹⁶ Though over half of the decade had elapsed, and war losses were approximately known, the apparently preferred *mm0* projection, pointed to a 1950 population of 145.5 million (or 146.3, if adjusted for underenumeration of children in 1940), a decennial increase of 13,791,000, and a rate of increase of 10.47 percent.¹⁶ The Census Bureau adopted this projection as its own forecast, and it still stands as the official forecast for years beyond 1960. The highest of the eight projections then given, made on the assumptions of low mortality, very high fertility (averaging 3 million births a year in 1946-50), and an average of 200,000 in-migrants per year after 1945, pointed to a 1950 population of 148.0 million (148.8 if adjusted . . .), a 1940-50 increase of 16,317,000, and a rate of increase of 12.39 percent. Even this extreme projection was too low.

Finally, early in 1949, well toward the end of the decade, the Census Bureau released new forecasts, for the first time giving preference to an assumption involving appreciable net in-migration—*mm125*, implying one million in-migrants in the eight years ending July 1, 1955. This led to forecasts of the 1950 population as 149.9 or 150.7 million, according to whether the basis was unadjusted or adjusted for underenumeration of children in 1940. Both are now sure to be exceeded. The implied rate of increase in 1945-50 was 7.4 percent; actually it will approach if not exceed 9 percent.

Ten months ago the standing official forecast for 1970 was, in round figures, 160 million, and this was the figure commonly used by economists.¹⁷ Six months ago the revised official forecast indi-

¹⁶ P. K. Whelpton, *Forecasts of the Population of the United States, 1945-1975* (Bur. Census, 1947).

¹⁷ This was first published in Bur. Census, *Population—Special Reports*, Series P-46, No. 7, Sept. 14, 1946. Black and Kiefer relied on this forecast in their 1948 discussion of "The Food Needs of the United States," under the sponsorship of the National Planning Association. J. D. Black and Maxine Kiefer, *Future Food and Agriculture Policy: A Program for the Next Ten Years* (McGraw-Hill, New York and London, 1948), chap. xiii, esp. p. 119.

¹⁷ See sources cited in the preceding footnote, and P. A. Samuelson, *Economics: An Introductory Analysis* (McGraw-Hill, New York, etc., 1948), p. 30.

cated that this figure would be reached in 1960. Evidence now available strongly suggests that our true population will reach 160 million during 1955, if not earlier. Is this not startling?

While successive forecasts from 1937 to 1949 improved in approaches to the true population of 1950, all were too small by roughly one million for every year between the date of forecast and the publication of the target date. This suggests a conservative bias. Most influential and persistent has been the reiterated conviction that the fertility rate (a refined version of the birth rate) would soon fall from its supposedly abnormal peak to resume its interrupted decline. On this crucial point the evidence is still running contrary to the assumption.

In October 1945 Whelpton forecast 13.5 million births in the five years ending July 1, 1950. In March 1947, as his document was about to go to press, he raised this to 15 million.¹⁸ If he were revising again in August 1949, on the basis of births reported through June 1949, he might well put his medium estimate at 17.5 million. Here is at once an extraordinary indication of the lack of basis for a reliable forecast, and an indication of the continuation of a high rate of increase well beyond the time when it was supposed to have dropped.

Lynn Smith wrote not long ago: "To our human reservoir of 140 million people, each new year adds about two and one-half million units, draws off about one and one-half million. But the net change in any one year is far less than one percent, and anything greater would be phenomenal."¹⁹ Actually the figure of 140 million was passed in 1945, and in each of the eight years since 1941-42 the net increase of population has "phenomenally" exceeded one percent. Even the latest forecasts of the Census Bureau, already proved too conservative in 1947-48 and 1948-49, imply continuance of a rate above one percent through 1950-51, if not through 1951-52. In retrospect, Smith must have been unduly impressed by the 1930's, for our annual rate of increase has been below one percent *only* in 1918-19 and in the eleven years from 1930-31 to 1940-41.

We should not expect an indefinite continuance of the high crude birth rate, the huge number of births, and the high over-all rate of population increase that have characterized the past three years.

¹⁸ Whelpton, *Forecasts . . .* (1947), p. 33.

¹⁹ T. Lynn Smith, *Population Analysis* (McGraw-Hill, New York, etc., 1948), p. 389.

Declines in these figures are likely within a decade, if merely because of the small number of American babies born in the 1930's. We need not be surprised if in some years of the 1950's the rate of population increase should fall well below one percent, even if we avoid a repetition of the major depression of the 1930's. But it is already clear that the huge number of births in the 1940's has laid the basis for another population upsurge in the 1960's and 1970's, unless fertility should fall far below the levels of the 1930's.

As to long-term forecasts, say for 1980, 2000, and beyond, I merely warn that none of them can be trusted. In the light of the productive potential the 1940's have proved that we possess, even the ultimate limits of our population are assuredly much higher than Pearl and Reed calculated and reasoned when they wrote their 1920 paper.²⁰ Moulton's recent question, whether our population might conceivably double to 300 million in the next 100 years (with an eight-fold increase in the per capita consumption level),²¹ no longer seems preposterous, though it is more than 50 percent above what Pearl and Reed computed (197.3 million) as our maximum for all time.

Some will regard the change in population prospects as the end of a bright vision of shrinkage to some "economic optimum population" at least several million below that of 1945, perhaps as low as 100 million.²² Others will view it as a welcome relief from a nightmare that has seemed all too realistic. Others will see in it a mere change in our complex of problems. It is certainly that, if nothing more.

Sobering Reflections

Let me not be understood as criticizing, blaming, or attacking the population specialists and forecasters for having been wrong in their reasoned guesses. Most of those whom I quote or cite are my friends, or at least friendly acquaintances, and I could make out a pretty good case in their behalf. If they are the scholars and gentlemen I believe them to be, they will welcome my candid

²⁰ See Lowell J. Reed, "Population Growth and Forecasts," *Annals Am. Acad. Pol. Soc. Sci.*, November 1936, CLXXXVIII, 162-166, and papers cited therein.

²¹ H. G. Moulton, *Controlling Factors in Economic Development* (Brookings Inst., Washington, 1949), chap. vii, "The Potentials of the Next Century." Moulton did not *forecast* 300 million population in 2049; and this figure is otherwise not properly comparable with Pearl and Reed's, since they did not assume a rapid rise in per capita consumption.

²² See an amazing passage in P. K. Whelpton, *Forecasts*. . . . (1947), pp. 64-65. Cf. T. Lynn Smith's observations in his *Population Analysis*, pp. 3-4, 388-389.

exposition, and not resent it, though perhaps regretting that they had not beaten me to something better. Surely we are all devoted to the search for truth, and have to learn by our own mistakes.²³ If confessions were in order, I have many sins to confess, and I take no pride in my own forecasting record.

Though we all know that forecasting is inherently hazardous, we have tended to believe what Baker told the International Conference of Agricultural Economists in August 1930: "The population of the United States ten, twenty, even fifty years hence, can be predicted with a greater degree of assurance than any other economic or social fact, provided the immigration laws are unchanged."²⁴ Conceivably this may still be literally true; if so, it reflects most adversely upon the reliability of other forecasts. When in 1939 I publicly dissented from this view as to long-term forecasts, I clearly implied that population forecasts up to 30 years might be accepted with reasonable assurance.²⁵ In this I was gravely in error, as both the 1930's and 1940's have shown. I am ashamed that, like most of my fellow social scientists, I have so long accepted the conclusions of the population specialists with naïve faith. We ignore at our peril this general rule: we can ill afford to accept uncritically, and use as authoritative in our own work, the results of any other group of specialists. There is need of much more joint cultivation of zones in which economics overlaps other fields of specialization.

Heretofore I have been merely a "consumer" of population data and forecasts. I was "stabbed broad awake" last fall, when the Census Bureau raised its forecast for 1950 over five million above what it had predicted two and one-half years earlier. After recent careful study of a great deal of the work of the specialists, I have increased admiration for their technical achievements and assemblies of data, and profound sympathy for them as they have responded to incessant demands that they pick a projection and call it a forecast. But as of mid-1949, I have very limited respect for the judgments and opinions used in making this choice. I am also

²³ Let me quote two sentences from Stuart Chase (*The Proper Study of Mankind . . .*, Harper, New York, 1948, pp. 20, 187): "The whole point of science, says Oppenheimer, is to invite the detection of error and welcome it. . . . Real scientists take pride in their discipline and are concerned when careful forecasts go wrong."

²⁴ O. E. Baker, "Population Trends in Relation to Land Utilization," *Proc. Second Internat. Conf. of Agr. Economists* (Menasha, Wis., 1930), p. 284.

²⁵ J. S. Davis, "The Next 100 Years of the American Statistical Association," *Jour. Am. Stat. Assn.*, March 1940, XXXV, 266.

disturbed that, so far as I can ascertain, the guild of population specialists has minimized the errors of judgment, published no serious investigation into the sources of error, and been slow to warn the rest of us that several basic assumptions which have long been cherished are either unsound or seriously questionable, even if definitive proof is not at hand. There is only slight encouragement in the masterly understatement in *Population Index*, April 1949 (XV, 123): "Until recently the course of population development in Western nations was generally believed to be well charted and understood. This is now a matter of some doubt." But there are doubtless good reasons for this special case of "cultural lag."

As I see it now, it is a duty of interlopers like myself, and of consumers of population data like yourselves, to insist that old ideas be candidly reexamined in the light of evidence now available, that new ideas and evidence be sought, and that the cooperation of other specialists be enlisted in these tasks. Meanwhile, it is disheartening to have to assert that the best population forecasts deserve little credence even for five years ahead, and none at all for 20-50 years ahead. Perhaps better techniques can be found. If not, there will be a gain if we admit that our population cannot be forecast within *any* reasonable margin of error, beyond a year or two.

My samplings of economic literature through mid-1949, and of individual economists personally, indicate that the great majority of our economists, even the ablest ones, are not awake to our radically changed population position and prospects. I forbear to cite examples, including persons in our own circle. But I adjure you—teachers, researchers, and extension personnel—to scrutinize your textbooks, lecture notes, manuscripts, and talking materials to see whether you are purveying false or obsolete ideas.

You have heard the old statement: "It ain't so much what we don't know that hurts us; it's what we know that ain't so." This is better than half true. We have a big job of *unlearning* to do. Population forecasting is *not* a simple matter. Available techniques do *not* permit reliable prediction to be made for five, ten, twenty, or fifty years ahead. The best may be *far* wrong. Our net reproduction rate is *not* near unity, but has been well above it ever since 1940. It is *not* reliable as a basis for prediction.²⁶ There is *no* assurance of

²⁶ See Bur. Census, "Recent Trends in Population Replacement," *Population-Special Reports*, Series P-47, No. 2, Mar. 27, 1947, esp. p. 5.

any peak population, at any future date. The age structure of the population does not "inherently" point to cessation of growth and eventual population decline. Our major population problem is not prevention of such decline. There is no adequate basis for expecting the fertility rate, or the crude birth rate, to drop to or below the level of the early 1930's and to remain at that low level. While the long-term trend of our rate of population growth may still be downward, this does not necessarily support extrapolation of the curve from the mid-1930's. We do well to recall Raymond Pearl's observation that in this country the word "extrapolation" is usually mispronounced with the stress on the syllable "trap." Let us be on guard against that subtle disease, "trenditis," and especially its more dangerous variant, "short-term trenditis." Finally, planning for food, agriculture, industry, schools, et cetera, can not be safely done on the basis of supposedly expert population forecasts.

Check up on the evidence if you discount or disbelieve what I have said; but beware of relying on those who, however authoritative they appear, are loath to change their opinions until overwhelming evidence is at hand. If we continue to build on the crumbling foundations I have described, we shall have no excuse for consequent errors in our own work.

The lag of years in our understanding of important population developments is unnecessary and inexcusable for the future, if not for the past. After all the painstaking work that has been done in the past 30 years, it is surely possible to bring social scientists roughly up to date on this subject, and to keep them so. For a fair approximation to significant truths we need not wait until the 1950 census data have been collected, tabulated, laboriously analyzed, the results of analyses published, these publications studied, and the results utilized by social scientists in other books published after considerable delay. We ought to cut the period of currency of obsolete ideas to a fraction of what it is.

There are other phases of agricultural economics and rural sociology of which much the same can be said. Our basic research needs to be tied in to our current appraisals, and the usual gap between them more effectively bridged.

Hints as to Significance

You cannot expect me, here and now, to sketch all the economic and social consequences of the population upsurge in the 1940's.

The President's Research Committee on Social Trends, in its studies in 1930-33, had revealed to their eyes a population prospect "radically different from that predicted a generation or even a decade" earlier. Population experts, they said in their report, "have projected their curves into the future and the outlook is startling."²⁷ Twenty years later it will be clear that they fell into the trap of their own extrapolations! For business, private investment, consumption, and many aspects of public policy, the true position and outlook are now radically different, not only from what was pictured in 1930-41, but also from almost everything yet available in print.

One striking change is already upon us: the flood of young children entering school. Experts had led us to believe that the population of school ages had permanently passed its peak by 1940. This peak has already been substantially exceeded. The official forecasts by age groups up to 1955, and of school enrollments by grades up to 1960, point to much higher levels in the 1950's.²⁸ Though published only last February, it is already clear that these will be too low, and no one can make a reliable prediction in this important field, beyond the point at which it is affected by future births.

Four general suggestions I have to make. First, expression of national totals in per capita terms is more than ever important, even for such figures as gross national product, indexes of industrial production, and deflated consumption expenditures.²⁹ Second, several series might well be further refined (when this can be done) to adjust for changes in age distributions; for many purposes young children, and the elderly and aged, deserve less weight than persons in age groups from 15 through 59.

Third, we should be especially alert to evidence of changing standards of living, in the best sense of those balanced combinations of goods, leisure, other freedoms, and family life that people desire and are willing to work and save for. The notion that consumption

²⁷ *Recent Social Trends in the United States . . .* (McGraw-Hill, New York and London, 1933), I, p. xx.

²⁸ Bur. Census, "Forecasts of Population and School Enrollment in the United States: 1948 to 1960," *Current Population Reports—Population Estimates*, Series P-25, No. 18, Feb. 14, 1949.

²⁹ Personal consumption expenditures in 1948, as now officially estimated, were 227 percent of those in 1929. But *per capita* consumption expenditures in 1948, deflated by the Consumer Price Index, were 135 percent of the corresponding figure in 1929.

is the only significant component of levels and standards of living is widely prevalent. It needs to be heavily discounted. Beyond some points, I submit, people prefer less work to more goods; more freedom to more goods and shorter hours; and earlier marriage and more than one or two children to more sharply rising consumption levels per capita. This variant of a broader law, of which the so-called laws of diminishing utility and diminishing returns are other variants, merits much more attention than it has received.

Fourth, the demographic consequences of a "full-employment policy" need to be carefully explored. Expansion of so-called social-security measures, adherence to the objective of maintaining high and stable employment, and some degree of success in this direction, may constitute important new influences on attitudes that affect population development.

The special significance for agriculture I must leave to you to explore. The population developments that have already occurred profoundly affect the demand for farm products, and the altered population prospects are important for appraisals of future demand. This applies not merely to population totals but also to age distributions, and to the outlook for the short run and the long run. In this field, as in broader ones, it is useful to look back over various analyses of the consequences of a smaller and prospectively declining population, and then make reverse adjustments for a larger and rising population. Let me give one example.

On October 30, 1936, O. E. Baker addressed the Population Association of America on the "Significance of Population Trends to American Agriculture,"³⁰ to which he had adverted briefly in his 1930 address. He began: "The prospect of the early approach of a stationary and later probably declining population in the United States and in northwestern Europe profoundly alters, in my opinion, the long-time outlook for agriculture in the United States." He then expected the rate of increase in the 1940's to be "not over one-twenty-fourth." "About 1950, perhaps before," he said, "births appear likely to balance deaths; and, unless the restrictions on immigration are relaxed, the crest of the nation's population will be

³⁰ *Milbank Memorial Fund Quarterly*, April 1937, XV, 121-134. The editors began their headnote thus: "The decline of the birth rate to continuously lower levels is no longer of merely academic concern." Another sentence is worth quoting: "Whatever may be the implication of declining fertility in this country, it is generally agreed that fundamental adjustments must be made at least in our commercial structure which has been geared to the expectation of increasing population."

reached"—at some 139 million. "The weight of evidence," it seemed to him, "favors a continued decline in births for at least two decades at a rate not much less than during the past decade."³¹ He went on to discuss some consequences of a declining population: the lowered demand for milk, as the number of children declines;³² a decline in consumption of farm products; a more rapid decline in urban than in rural population; "a less commercial agriculture"; "many of the characteristics of an economic depression, including population pressure on the poorest land"; and "increasing concentration of wealth," with a transfer of "poverty to rural areas." What would the converted Baker say today?

My own guesstimate is that the domestic demand for American farm products and farmers' services will be far greater than Schultz reasoned when he wrote his book for the Committee for Economic Development.³³ If so, the outlook for our agriculture is basically much less pessimistic than he then thought. The Bureau of Agricultural Economics report on *Long-Range Agricultural Policy* submitted to the House Committee on Agriculture on March 1, 1948, also needs revision. In conjunction with our higher consumption standards, I believe that our demand for milk, meat, and other animal products will become such as to put pressure upon our ability to expand the output of these products. If so, it will contribute more to the expansion of improved pastures, and to prevention of unmanageable surpluses of grains, than we have previously had a right to expect.

³¹ I am glad to say that last month, in an address at the McGill University Summer School, Baker frankly recognized the population events of the 1940's, acknowledged that he would earlier have considered them impossible, and added: "Never, it would seem, is the future so uncertain as at present."

³² He cited four urban studies indicating that children consume 50-100 percent more milk per capita than adults.

³³ T. W. Schultz, *Agriculture in an Unstable Economy* (McGraw-Hill, New York and London, 1945), esp. chap. iii. As to the foreign demand, I reserve judgment.

SIGNIFICANCE OF THE "GENERAL PRICE LEVEL" AND RELATED INFLUENCES TO AMERICAN AGRICULTURE

O. V. WELLS

Bureau of Agricultural Economics

PERHAPS the best way to start is with the statement by J. W. Tapp before the Western Farm Economics Association at Davis last June:

"It is my impression that most economic historians would agree that the more violent misbehaviors of the *general price level* can be traced directly or indirectly, to disturbances which lie largely outside the realm of the so-called 'free enterprise' segment of our economy. Certainly the most disastrous of the violent upswings in the general price level in this century can be traced to repercussions from our two major world wars, and making war is not essentially a 'free enterprise job. . . .'

"It seems to me that the prime essential for a reasonably stable price level is to live in a peaceful world. . . ."

I agree not only that the greater portion of the violent fluctuation in prices, including farm prices, over the last 35 years are attributable to our war experiences but also to the clear fact that these disturbances can hardly be charged against the free enterprise system. But I assume that none of us is interested in attacking the free enterprise system: rather, our chief interest lies in first trying to see that the system does work over the longer stretches between emergencies and, second, in endeavoring even under emergency conditions to so order our economic actions as not to create unnecessary strains during the readjustment which must inevitably lie ahead.

Having said this, I next want to advance some three or four simple propositions which will exhaust the real content of this opening statement, despite the explanatory notes which follow. These are:

Proposition 1: Aside from the extreme cases such as accompany war or all out defense preparations on a grand scale, the concept of a *general price level* is not likely to prove very useful in economic analysis, especially in endeavoring to develop or appraise specific actions in the policy fields. Rather we are more likely to be interested in a series of partial, special purpose or differential price levels and the general trend in employment.

Proposition 2: The central issue in stabilization theory as to whether (a) one or a few simple, indirect fiscal devices can be used to assure a stable American economy, or (b) a series of co-ordinate devices should be developed, the most of which assist in stabilizing some essential sector of the economy instead of serving as general influences, is steadily being resolved in actual practice along the lines of the second alternative.

Proposition 3: So far as price movements are concerned, it appears that our current economic system is such that prices or rates in many fields can be raised much more readily than they can be lowered. That is, we generally define *inflation* as the concurrent upward movement of most prices and rates; *deflation* as the downward movement of production and employment and such prices and rates as are flexible.

Proposition 4: Although the farmer's first line of defense is high level non-farm production and employment, the special circumstances surrounding American agriculture are such that some of the more difficult problems relating to farm prices and the use of farm resources are not likely to be solved, by general—i.e., monetary, tariff and fiscal management—measures either to the satisfaction of farmers themselves or even in terms of the public interest.

The "special circumstances" referred to above include an apparent capacity to produce in excess of the current effective demand originating within the United States itself, an uncertain foreign market and finally a relatively immobile set of resources along with a form of economic organization which clearly indicate that reasonably prosperous conditions in farming are in considerable part dependent upon the success of farm people in maintaining or improving their collective bargaining strength.

When I started work on these notes, I assumed that this would be one session which could move smoothly forward on a noncontroversial level since economists have generally agreed that governmental control, or at least a considerable degree of regulation, had to be exercised in the fiscal-monetary field. However, some reading and a few statistical exercises have convinced me that even this hope is not likely to be realized.

I find that modern monetary theory has become an attenuated affair and that most of the current discussions now center around fiscal theory and fiscal management. That is, "Theoretical analysis has increasingly concentrated on setting forth both the determinants of the flow of spending and the effect of the resulting spending on output and employment."¹

¹ See: Introduction to Henry H. Villard's section on monetary theory in Howard S. Ellis', *A Survey of Contemporary Economics*, published for the American Economic Association by The Blakiston Company, Philadelphia, 1948; as well as the

Some 25 years ago, for example, Holbrook Working started the analytical section of his discussion of factors affecting Minnesota potato prices with the simple statement: "The first factor which must be considered is the value of the dollar" and then proceeded to divide or deflate the seasonal average prices by the B.L.S. wholesale price index as the best available measure of the general price level.

Today, the terms have changed. The Postwar Agricultural Policy Report of the Land Grant Colleges declares, "High-level employment in nonagricultural industry means more to farmers than any 'farm program' the government may attempt," and Congress itself approaches the essential problem of economic stability not by a new monetary or banking route but rather through the "Employment Act of 1946."

Some attribute this shift from older quantity theory to the aggregative income approach to the late Lord Keynes who was reasonably explicit when, in referring in the *General Theory* to certain unsatisfactory economic units or terms, he said:

"The well known, but unavoidable, element of vagueness which admittedly attends the concept of the general price-level makes this term very unsatisfactory for the purposes of causal analysis, which ought to be exact."²

preface in Albert Gailord Hart, *Money, Debt and Economic Activity*, Prentice-Hall, New York, 1948.

² The most recent text on agricultural prices goes some distance, but by no means all the way, toward accepting this criticism:

"The general price level is a much used yet elusive term which is subject to widely differing interpretations. While it may be described simply as an average of all prices at a given time, it is difficult to comprehend, not only because of the multitude of prices entering into the average, but also because of the differing relative importance of the component price items. There is a natural tendency on the part of some persons to minimize, if not completely overlook, prices with which they have little contact and to overestimate the importance of those prices which concern them most. . . .

"Inherent in any objective concept of the general price level is the implication of a price system. If one accepts the proposition that there is a general level of prices worthy of consideration, he places emphasis on the average involved. . . . (But) even though (certain) relations between individual prices are recognized, it is hazardous to accept the general assumption that all prices are related to the extent that they move in the same direction over a given period of time. Exceptions to such a rule are easily found.

"In view of the limitations involved, the question might well be raised: Why think of a general price level at all? In the first place, there is a strong element of truth to the proposition that prices tend to move in the same direction over a given period of time, especially if the period is long. Moreover, there is a marked central tendency in a frequency distribution of price changes of individual commodities measured over a similar period."

From: Warren C. Waite and Harry C. Trelogan, *Introduction to Agricultural Prices*, Burgess Publishing Company, Minneapolis, 1948, Chapter II.

Earlier still, Keynes had observed in the *Treatise* that statistical comparisons were always difficult at best and that as a general rule, for each special purpose a separate or special index number needed to be calculated.

I am myself inclined to attribute this shift in terms and methods of measurement to other sources, including the analytical hunt for *causes* as well as *effects* and the development of national or aggregative income and expenditure statistics by the statisticians in the U.S. and the U.K. In fact, one of the beloved founders of this Association, Dr. George F. Warren, had himself anticipated the Keynesian view of index numbers in developing Bulletin 999 which the U. S. Department of Agriculture released in August 1921.

Warren's calculations in Bulletin 999 were an explanation of the situation existing in the early summer of 1921, an explanation which indicated that all wholesale prices do not rise and fall proportionately and that resort to special or partial indexes were needful. To quote:

"The index of wholesale prices in June, 1921, was 151 (basis 1909-14 = 100)."

"The weighted average price of 31 farm products was 106 (basis 1909-14 = 100). These farm products, therefore, had an exchange value or purchasing power of 70 percent of the five-year average before the war." Warren further indicated that "if farm products were omitted from the wholesale price index" the average would be higher and the farm comparison still further worsened. Warren's concentration on the differential behavior of farm prices was certainly well warranted.

But Dr. Warren and many of his contemporaries were also very directly concerned with the control or stabilization of the purchasing power of the dollar or inversely, the general price level.

To a considerable extent, this concern with respect to the purchasing power of the dollar arose from the rapid increase in the farm debt structure during and immediately following World War I. I recognize the relation between debts and changing price levels but it is not a subject that I intend to further discuss, since it seems to me that the answer lies largely in the field of more prudent management of private debts and an endeavor to see that prices received by farmers generally maintain some reasonable relation to prices paid.

This concern with money or dollar purchasing power is still

current, as witness: (1) the recent statement by Dr. T. W. Schultz that, notwithstanding the peculiar properties of parity prices, "there [still] remains among the rank and file of farm people a belief that it is money, and the value thereof, that should be managed by the Government, and not the price of eggs, cattle, butter, or of any particular farm product,"³ and (2) the efforts of the American Farm Bureau and others, including some leading banking officials and the Committee for Economic Development, to secure the establishment of a National Monetary Commission to determine, in the interests of currency stabilization, "what changes are necessary or desirable in the banking or monetary system of the United States, or in the laws relating to banking or currency, by reason of domestic or international considerations or both."

The proposal for a National Monetary Commission has recently been approved by the U. S. Senate and referred to the House. Should such a Commission be established in the near future it would embark on the first comprehensive official review of the whole U.S. monetary and credit system since the study undertaken 41 years ago under the Commission created by the Act of May 30, 1908.

The approach that such a Commission might take and its final recommendations would surely be of wide interest. However, there is little reason to believe that the work of such a Commission or changes in our currency system are ever likely to yield the simple, indirect means of stabilizing the American economy which some very competent authorities once seemed to have believed were possible. This is not to say that some very useful reforms might not result; I believe they would.

But at the same time, I also believe that the really crucial issue in current economic theory—theory which influences action more

³ This is a view which Schultz does not emphasize or further develop beyond remarking that "It is a view that has much merit, for it recognizes a significant element in the pricing problem." Schultz's accompanying suggestions for a farm policy call for a wide range of positive measures dealing specifically with agriculture in line with his express statement that "what we have experienced in agriculture suggests that vigorous, enterprising farms and equally vigorous, well-designed governmental programs may be highly complementary." So far as direct action affecting average farm prices or incomes is concerned, however, Schultz joins the modern fiscal management school indicating that the first line of defense should be to stabilize the industrial economy at high production and full employment while at the same time recommending as a second line of defense compensatory farm payments in case of business depression and unemployment.

See: T. W. Schultz, *Agriculture in an Unstable Economy*, McGraw-Hill, New York, 1945, pp. 164, 219, 220, 254 and 255.

than we generally admit—turns around the question as to whether a few simple, indirect devices will carry the load or whether a whole series of additional devices must also be developed, each of which will gradually assist in giving some greater degree of stability to a particular *sector* of the American economy. Certainly, practice is fast trending in this second direction and this is also increasingly true of theory as such.

For example, Oscar Lange in his *Price Flexibility and Employment* indicates that it may be necessary to endeavor to directly stabilize several key items such as wage rates and the prices of certain leading farm commodities as well as using the fiscal-monetary approach. A similar inference can be made from the Journal article which won this Association's Distinguished Publications Award a year ago, Willard Cochrane's *Farm Price Gyration—An Aggregative Hypothesis*. That is, Cochran starts from the fact that "To an important degree agriculture represents a water-tight compartment within which there is considerable fluidity, but the connective valve between the agricultural compartment and the rest of the economy works poorly and sometimes not at all." The result is that American farmers and their representatives are strongly inclined toward the "action programs" with which we are now so familiar whenever they find themselves faced with excess supplies and falling incomes, whether the cause is due to depression at home, blocked foreign demand, or excess supplies simply as the result of sheer productive ability aided by good weather. The American labor movement has also already moved a long way along this same trail with collective bargaining, a device which tends to either stabilize or gradually increase wage rates, which are our most important single series of prices. But these are only selected examples. There are any number of fields where prices or rates are semi-independent or at best are only loosely related to any central or single dominating general price influence because of immobile resources or special factors affecting the demand for or pricing of the service or product.⁴

⁴ Perhaps attention should be called to the fact that the much used wholesale price index of the B.L.S. is itself a special purpose index, despite its comprehensive commodity coverage. That is, it covers only commodities all priced at the same stage in the marketing process. It does not accurately measure changes in the purchasing power of the dollar for the average American or his family. This is much better done by a cost of living index, nor does it measure the most important single item in business costs, wage rates. That it has been so much used is due it seems to me to three facts: First, the great war-induced swings in this and other economic

It is this general line of reasoning with respect to multiple causes for economic instability and the resultant form which this gives the modern drive for economic security which leads to Propositions 1 and 2. Meanwhile the behavior of administered prices and, equally important, union wage rates of course underlie Proposition 3.

Meanwhile we are told that the current farm movement often tends to *over value* farm products. Why?

Essentially this argument defines the special characteristics of American agriculture which leads to Proposition 4.

The case runs something like this: American agriculture has an excess producing capacity which is likely to continue in use under a free price system and which will be extremely difficult to handle even assuming a strengthening of the current trend toward government regulation. Meanwhile, the demand for farm products is so inelastic, either in terms of the ordinary commodity demand schedules of the agricultural price analyst or the more recent developed income elasticities for food, that the probable supplies of farm products can only "clear" domestic and foreign markets over the next decade or more at considerably lower relative prices than the equilibrium between prices received by farmers and prices paid which has been approximated some two or three times under conditions of satisfactory employment since 1900.

Perhaps this argument is correct, especially if we assume more or less unsatisfactory employment conditions, the failure of farm programs generally, and an increasingly weak and difficult foreign market situation. But I question each of these depressing assumptions: We shall surely endeavor to so shape national policies as to work toward a brighter outcome. Various fiscal and monetary measures will be used in this effort, but I am still skeptical of attaining perpetual prosperity simply through deficit financing or, to use a newer term, financing from non-tax resources. Something more is needed.

series are of course related; second, economists and statisticians have generally been inclined to measure prices in those markets which most clearly approximate the classical definition of a "free market" and which they considered were the more sensitive indicators of economic change; and third, the wholesale price series are easiest to obtain so it is in this field that we have the longest historical series. Carl Snyder of the New York Federal Reserve Board did endeavor to develop an over-all measure of the general price level in the 1920's. So far as I am aware, it was never much used.

In conclusion, it seems to me that the four factors which most immediately determine U.S. farm prices or returns are:

- (1) Consumer demand within the U.S., of which the *average level of employment* is the most important single determinant,
- (2) Foreign demands, of which *the availability* of dollar exchange, or the means of obtaining it, is the most immediate single determinant,
- (3) Supplies of agricultural commodities and their distribution between uses or markets, actual or in reasonable prospect, and
- (4) The bargaining conditions under which farm supplies are marketed.

Perhaps the first of these factors is by all odds the most important. I think it is. However, this does not mean that the supply and foreign demand factors can be ignored, nor that farm returns are not also significantly affected by the bargaining factor. Farmers can exert a direct influence in this area, and in any event it is clear that farm programs are here to stay. Such programs may well be, probably are still only in the experimental stage, but it seems to me that farmers need some specific stabilizing devices rather than simply relying upon indirect controls of so vague an average as the general price level.

Such an approach does not accept the over-valuation theory but at the same time it does not finally answer it. In general, our studies in the Bureau of Agricultural Economics have given us reason to believe that farm prices and returns may be held at far more satisfactory levels over the next five to 25 years than was the case in the 1930's.⁵ Such an answer assumes (a) that we shall gradually develop a relatively stable peace, and (b) that farmers can count on continuing activities in the farm program field.

I know that this is a prospect which alarms some, especially with the fear that the price of favorable returns to farmers will be increasing central control and regulation. I think that there is very little chance of escaping such a conclusion in case of depression and the development of an underemployed, "static" economy. However, it seems to me that the chances are we will be able to avoid this, chiefly because we are still a young, growing nation, which leads

⁵ See table 1 in the B.A.E. report, *A Study of Selected Trends and Factors Relating to the Long Range Prospects for American Agriculture*, Committee on Agriculture, House of Representatives; Eightieth Congress, Second Session, released March 10, 1948.

me to the final conclusion which may be stated as Proposition 5:

The chances of maintaining a free, "dynamic" economy—that is, of minimizing necessary controls or restrictions and maximizing the free enterprise area—are greatest in an expanding economy, probably under conditions where many of the partial price or wage levels are slowly rising over time. The growth factors in such a system not only tend to offset some of the more undesirable effects of regulation or centralization, but also minimize the need for such measures as well as offering the only acceptable solution to our most difficult farm problem, agricultural underemployment.⁶

⁶ Such a statement with respect to the essentials of economic progress is of course open to question, especially in areas or periods of extremely rapid technological improvement. The Brookings Institution, for example, is inclined toward the argument for increasing technical efficiency, declining commodity prices, and stable wage rates, all of which should lead to an increasing "real" standard of living. Alvin Hansen, I believe, argues for a stable wholesale price level and slowly rising wage rates. There is also considerable current comment about the "money illusion" which is created by rising prices. Nevertheless, it seems to me that the primary producers and small scale businessmen who are essential to a free enterprise economy will be best provided for under the proposition as stated, especially in view of the increasing trend toward rising wage rates and costs of Government.

SIGNIFICANCE OF THE GENERAL PRICE LEVEL AND RELATED INFLUENCES TO AMERICAN AGRICULTURE: FURTHER COMMENT

J. W. TAPP

Bank of America

ONE of the purposes of a meeting such as this is, as I understand it, to enable economists to engage in their favorite pastime, which is "to point out the errors of the economists of yesterday and, of course, to perform a similar service for their contemporaries." It is in this spirit that I am addressing my remarks, first toward some of the statements and "between the lines" implications in the President's address.

While I agree in general terms with Proposition 1 as stated, it seems to me that President Wells has perhaps gone too far in suggesting the limited usefulness of the concept of the general price level. The possible usefulness of the concept in extreme cases, such as war or all out defense preparations, is admitted. But, during the past 35 years, we have been devoting an inordinate portion of our lives to living through just such "war" and "defense preparation" periods. We are still in such a period with no near term prospect that we shall soon see its end. Thus, the "exceptional" war and defense impact on the general price level and the national budget is tending to become the "usual" situation, as witness our present national budget of 35 billions of dollars for past, present and future wars (including foreign rehabilitation and occupation expenditures).

I would also add a word on Proposition 1 about the need for caution in the use of "partial" or "special purpose" price levels. In some respects we have had altogether too much use of such special purpose price indexes as a basis for the development or support of a great variety of frequently altogether inconsistent single purpose policies in the farm economics field. This is true, for example, of the much maligned parity price concept as applied to individual farm products. The single purpose goal of parity prices for farm products generally is one thing. But the application of this same idea to individual farm products as a single purpose objective is sheer economic folly to any who are interested in facilitating the inevitable agricultural adjustment problems of the present post war period.

In Proposition 2 the conclusion is stated that in actual practice a series of coordinate devices are being developed for attempted stabilization of the American Economy as contrasted with the possible attempted use of one or a few simpler indirect devices. Here again I expect that Mr. Wells may be right, but the evidence is somewhat confusing. In the first place, it is not altogether clear which policies or devices are contributing toward stability and which ones are operating in the direction of greater disequilibrium rather than greater stability. Secondly, I think it might be well to give more consideration to the possibility that the use of an extensive series of supposedly coordinate devices may, in effect, make it more difficult, if not impossible, to make effective use of the few simple devices which might form the core of a limited economic stabilization program for the American economy. Between the lines I would comment on the great difficulty being experienced in keeping our myriad economic policy devices in a co-ordinate pattern.

The really vital question, it seems to me, is whether or not we are making the right choice, as between the use of indirect and direct devices. If we *are* moving in the direction of a series of coordinate devices, where will we be when we finally get where we seem to be going? How long a series of devices will we have? How successful will we be in keeping them "coordinate"?

Another aspect of this problem, of course, is the nature of the goals which are established for "economic stability," whether we think in terms of agriculture or the economy as a whole. The more ambitious the goals, the more rigorous and the more dangerous must be the specific devices which are to be used for their attainment. And if we insist upon quite specific goals for each important sector of the economy and the necessary special devices to quickly attain those goals, is it altogether likely that we shall avoid the type of Authoritarian State that none of us would welcome as an overall objective?

Without attempting to overstate the case, it would be well to point out some of the advantages of using to as large an extent as possible a "few simple devices" which will contribute to economic stability. One of those devices is "money management."¹ In a recent discussion of the future of the Federal Reserve System, W.

¹ See "The Future of the Federal Reserve System," W. Randolph Burgess.

Randolph Burgess stated—"There are great advantages in trying to influence economic fluctuations through the money supply. In the first place, it can be done. The second advantage of using monetary action as a method of influencing business is that this method is consistent with democracy. You don't have to tell the individual borrower or lender what to do, but you create the conditions under which he makes his own decision.

"Admittedly, the huge national debt and responsibility for the government security market have limited the freedom of credit policy since the war But, any skeptic as to the power of money in any economy does well to examine the dramatic illustrations of recent basic changes in money values and credit policies in Belgium, Germany, and Italy. These were extreme cases, but they revealed vividly the improvement that can follow large doses of good old fashioned monetary medicine."

Burgess also makes some cogent but less hopeful comments on the use of fiscal policies or "compensatory spending" as a counter cyclical device. "According to the theory, spending should be reduced when the economic goose hangs high, and increased in depressions. So far, about all we have succeeded in doing since this theory gained official sanction has been to increase the budget in both booms and depressions. Budgets are instruments of politics, and to make them also economic tools is asking much of human nature. . . . One may summarize by saying that while the budget should be an influence for economic stability, and we should do all we can to push it in that direction, we must not be too sanguine of our success."

Without belaboring the point, and with full recognition of the limitations of monetary and fiscal devices, I believe that every consideration should be given to the attainment of maximum results from the most intelligent use of the available simple and indirect devices that contribute to general economic stability. At worst any real accomplishments in this direction will minimize the propensity to experiment with more and more ambitious detailed "controls."

We should not lose sight of the fact that it has not been many months since a great many serious students of the economic scene were acutely concerned about the possibility of further price inflation. There are powerful economic forces at work which could make it possible to maintain a high general level of employment,

production and national income. Holdings of liquid assets by individuals and corporations (*including farmers*) are at a level undreamed of in any previous period on our history. The money supply is high even in relation to recent high levels of production and income. Furthermore, as contrasted with previous postwar periods, the national debt and budget situation is such that we would appear to have for the foreseeable future a depression proof money supply and relatively low interest rates. The private debt structure is not over-extended. The security and commodity markets are not threatened by over-extended speculative commitments.

Against this type of background it should be possible for those segments of the economy, faced with post war adjustment problems, to think primarily in terms of an expanding economy and alternative opportunities rather than in terms of a return to the defensive and restrictive atmosphere of the long pre-war depression years.

In spite of the above comments, I do agree in general with the statement set forth in Proposition 4 that even the most successful use of monetary and fiscal policies will not be adequate for many of the special postwar adjustment problems of agriculture. But, they can help to maintain the high level of production and non-farm employment which is the "farmer's first line of defense." Also, if we can retain reasonable flexibility in agricultural production and price policies this "first line of defense" may become a powerful offensive force for speeding up the adjustment of our agriculture to an expanding domestic market and such uncertain foreign markets as may be salvaged.

In a world which again appears to be moving in the direction of economic nationalism and bi-lateral trading, in spite of our expensive efforts to the contrary, it is of course all-important to our agriculture to maintain the broadest possible domestic outlets and expand them wherever feasible. Obviously, more can be accomplished in this direction if the general economic climate is favorable to expansion in non-farm industrial and related activities and for those branches of agriculture which are especially benefited by a high level of domestic demand.

There are good grounds for believing that the farm adjustment problems ahead may not be as serious for most lines of agriculture as those of the 1920's and 1930's, provided we face them frankly.

The "farm programs" which Wells refers to may help if they are not saddled with impossible goals and other "impedimenta." Basically, the financial position of agriculture is much stronger than that of many other segments of the economy. This is in striking contrast to agriculture in the 'twenties and 'thirties, particularly with respect to the nature and extent of farm debts and the more realistic repayment programs. A very much larger portion of agriculture is now "commercial," including the commercial family farm which purchases its horse power in the form of petroleum products instead of growing it as feed for horses and mules. True, cash expenses represent a larger relative outlay than in earlier years. These characteristics of present day agriculture should serve as a prod to the facing of adjustment problems. Adjustments, where needed, may be less postponable than in the earlier period. But if we are to meet these problems wisely and in the long run interest of agriculture and the nation, we must have some caution about trying to force farmers to fit into the all too rigid patterns which many of the current price support and related proposals would require. And I might say, quite frankly, that this is particularly true of this great Western country which looks too the future with an expansive glint in its eye. There is real concern as to whether the Congress and "The Secretary" can always move with sufficient speed, wisdom and forbearance to indulge these expectations of long term growth.

And now I conclude these rambling remarks with another quote from farmer Thad Snow of Missouri:

"The bad guesses of the dead economists of the slow-going past ought to warn living economists against over-sureness in these swift changing times."

GENERAL PRICE LEVEL AND RELATED FACTORS: FURTHER COMMENT

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I WOULD like to comment briefly at the outset on one or two of the more obvious problems posed by the concept of a *general price level*.

It is clear, of course, that there is no such thing as a *general price level* in the sense that all prices move in the same direction at the same time and by approximately the same amount. Although a large number and wide variety of price series move in the same direction on the up and down swings associated with wars and business cycles, there are always some which do not conform to the general pattern and even those which conform as to direction show wide dispersion with respect to the extent of their movement in a given period of time. Furthermore, if one attempts to develop an index to reflect changes in the *general price level* he is immediately confronted with the necessity of making decisions on such questions as the price series to be included, the weight to be assigned each series and a host of others that give the finished product a distinctly man-made cast, frequently bearing the unmistakable imprint of its maker.

These difficulties are by no means limited to the price level concept, however. Although it provides cold comfort to the seeker of economic truth, the concepts *full employment*, *high level employment*, and *average level of employment* present much the same difficulties and might well be substituted for general price level in Mr. Wells' quotation from Lord Keynes relating to unsatisfactory economic terms. To paraphrase: "The well known, but unavoidable element of vagueness which admittedly attends the concept of *full employment* makes this term unsatisfactory for the purposes of causal analysis which ought to be exact." Certainly when one tries to reduce the concept of full employment, high-level employment, or average level of employment (the latter term used by Mr. Wells) to quantitative terms, he is confronted by a number of annoying questions such as what groups to include in the labor force, whether to weight employment in all industries equally and a dozen others that yield nothing, it seems to me, to the problems

confronting the price analyst who has the temerity to try to reduce the concept of a *general price level* to quantitative terms.

Here we are up against the practical question of whether it is worth-while to try to reduce such concepts as *general price level*, *level of employment*, and *cost of production* to quantitative terms. It seems to me it is, although I recognize the dangers of oversimplification and the fact that for many purposes it may be more productive to study the behavior of the components of the quantitative "measures" of such concepts rather than the measures themselves. One should add that in the interests of precision, the "measure" should be labeled for what it is and not be confused with the concept. For example, the index of wholesale commodity prices prepared by the Bureau of Labor Statistics should not be referred to as the *general price level*. I doubt, however, whether either agricultural economists or farmers have been led astray by such misuse of terms. Both have wandered down some economic primrose paths but they seem to me to have been of a different character.

I would like to return now to the question of whether the concept of a general price level has or can make a contribution to our understanding of the workings of the United States' economy or whether it has merely added to the confusion and is likely to continue to do so.

In Proposition 1 Mr. Wells states that aside from extreme situations such as accompany wars or all-out defense preparations, the concept of a *general price level* is not likely to prove very useful and that we are more likely to be interested in a series of special purpose or differential price levels and the general trend in employment. Reserving comment for a moment on the two stated exceptions to Mr. Wells' general proposition, which exceptions by the way seem to me to be quite important, I agree with the emphasis placed on studies of differential price behavior. Granted it is important to study the movement of individual and special purpose price series, it does not necessarily follow that a study of "general" price movements as reflected by some such index as the BLS index of wholesale commodity prices is unimportant. History is replete with instances in which the prices of an extremely large number and wide variety of goods and services have moved in the same direction at the same time. It seems to me such movements provide reasonable grounds for the assumption that under such circumstances prices may be moving in response to a common set of economic forces.

The fact that prices are moving in the same direction at the same time does not prove, of course, that the movement is the result of a common causal factor or group of factors. Much less does it indicate the nature of the causal relationships involved. It merely provides grounds for what seems to me to be a plausible hypothesis that, like any other hypothesis, must be carefully checked. If one feels there is no logical ground for the hypothesis that one or more major influences are likely to be at work during the broad up and down sweeps of prices which accompany wars and major business cycles; that there may be grounds for the hypothesis but no possibility of untangling or "measuring" such forces even if they exist; or that such theoretical and quantitative work as has been done constitutes a sufficient test and that the results are negative, then one must conclude that the general price level concept has nothing to offer.

My own view is that concurrent movement in a given direction of a large number of price series such as has repeatedly occurred in the past provides plausible grounds for the view that such movements are likely to be directly or indirectly in response to common causes. It is not necessary, it seems to me, for *all* prices to be moving in the same direction at the same time to make the hypothesis plausible nor for all prices to move by the same amount in a given period of time.

Emphasis on what seems to me to be the importance of continued study and analysis of factors outside agriculture affecting both agricultural and non-agricultural prices and more specifically the effect of monetary, fiscal and tariff policies on price movements does not mean:

- (1) That I think such studies should be carried on to the exclusion of other approaches. In a particular situation other factors, especially in the short run, may be equally or more important in determining the prices of particular commodities. In *all* situations other factors must be taken into account.
- (2) That I think monetary, fiscal and tariff policies exert the same relative influence on prices at all times.
- (3) That I think we are likely to discover or devise a simple mechanism that will enable us to keep the *general price level* "stable" as one might keep a hydraulic lift at a given level under changing loads by varying the pressure in the system. Price stability is a relative term.
- (4) That stabilization of the general price level in the sense of maintaining the BLS index of wholesale commodity prices at a given level

would solve all the problems of agriculture. We might still have too many resources in agriculture at a given time to yield returns at the margin deemed to be satisfactory from a social or political point of view.

You may feel that the foregoing statements in themselves pretty much wash up the general price level concept and the effect of monetary, fiscal and tariff measures upon prices; that like the Cheshire cat in "Alice in Wonderland," there is nothing left but the grin. I believe, however, that monetary, fiscal and tariff policies have had and will continue to have an important bearing on the price outlook in the United States' economy and that this is important to agriculture. It seems to me we have cycles in our economic thinking and that Mr. Wells has reached a new low in de-emphasis of the effect of monetary-fiscal-tariff measures on prices. I do not deny that we have perhaps over-emphasized the importance of these factors in the past. Mr. Wells has gone further than I would go in the other direction. I am not arguing for emphasizing these outside factors to the exclusive of other considerations. I am arguing for continuing to give attention to them.

But perhaps I am over-emphasizing Mr. Well's de-emphasis. His first proposition reads as follows:

"*Aside from the extreme cases such as accompany war or all out defense preparations on a grand scale, the concept of a general price level (italics his) is not likely to prove very useful in economic analysis, especially in endeavoring to develop or appraise specific actions in the policy fields. Rather we are more likely to be interested in a series of partial, special purpose or differential price levels and the general trend in employment.*"

During a great deal if not most of my adult lifetime, which goes back further than I would like to admit, we have been either on an economic binge, or trying to get over one, brought on by war. If one agrees that monetary and fiscal factors have an important effect on prices during and following wars, it seems to me that from a practical point of view he is agreeing that they have been important during the greater part of the last 35 years.

I agree with Mr. Wells' second proposition that the issue in stabilization theory as to whether we shall use one or a few simple devices to try to stabilize the United States' economy or a series of co-ordinate devices intended to stabilize individual sectors is steadily being resolved in actual practice along the lines of the second alternative. I would add that I think this creates a problem

of major proportions, namely, the problem of co-ordinating the co-ordinate devices to which Mr. Wells refers. One may feel that our present approach to economic stabilization is the best approach or that it is the only one available from a practical point of view. Regardless of one's views on this question, I think there is no doubt but that the approach we are taking serves to focus attention on the economic problems of individual groups and to foster pressures to get a larger share of the national cake with no one except a few impotent economists worrying about the effect of this procedure on the size of the cake to be divided among various claimants.

I am also in agreement with Proposition 1 which seems to me to be causally related to Proposition 2. I think few would disagree with this proposition which states that our current economic system is such that prices or returns in many fields can be raised much more readily than they can be lowered. I would add that governmental action intended to stabilize essential sectors of the economy (see Mr. Wells' Proposition 2) is tending to steadily increase the list of inflexible prices and rates and that agricultural price support programs bid fare to constitute another major step in this direction. Instead of reducing rigidities in our economy, we are increasing them. Regardless of what one may think of the social desirability or political inevitability of developments in the fields of prices and wages during the past 20 years, it seems to me that the increasing inflexibility which is clearly apparent on all sides is undesirable from an economic point of view. I will go further and say that in my opinion, relatively high and inflexible prices and wages in the United States may well prove to be a major barrier to the successful revival of world trade which in turn has important implications for world peace. I agree with Mr. Wells and Mr. Tapp that a prime essential for a reasonably stable price level is to live in a peaceful world.

I agree with Mr. Wells' fourth proposition that monetary, tariff and fiscal measures, even if they could be and were manipulated in such a way as to "stabilize the general price level" would not automatically solve all of the problems of agriculture. To mention but one, technological changes are steadily reducing the number of persons required in agriculture to produce the nation's food and fiber. If returns in agricultural and non-agricultural enterprises are to be more nearly equal, there is need for a continuing transfer

of manpower out of agriculture into other occupations. For such transfers to take place, a number of conditions must be met including provision of jobs at wages sufficiently attractive to bring about the desired shift. The wage differential between agriculture and industry is ordinarily sufficient to effect the transfer of manpower. The limiting factor is usually jobs. These are affected by the price-cost outlook which in turn is affected by monetary, fiscal and tariff policies as well as other factors. To the extent that monetary, fiscal and tariff policy can be made to contribute to a greater degree of economic stability in the nonfarm sectors of our economy, orderly transfer of excess manpower out of agriculture will be facilitated. Instability in the nonfarm sectors of our economy constitutes a major handicap to agriculture, not only because of the greatly reduced demand for agricultural products on the down swings, which obviously is of major importance, but also because of the handicap which uncertainty adds to maintaining a desirable pattern of resource-use in agriculture.

In conclusion, Mr. Wells lists four factors which he thinks most immediately determine United States farm prices or returns. These are:

- (1) Consumer demand within the United States of which the *average level of employment* is the most important single determinant. (Italics his).
- (2) Foreign demands, of which *the availability* of dollar exchange, or the means of obtaining it, is the most important single determinant. (Italics his).
- (3) Supplies of agricultural commodities and their distribution between uses and markets, actual or in reasonable prospect.
- (4) The bargaining conditions under which farm supplies are marketed.

It seems to me the first so-called conclusion still leaves unanswered the all-important question of what factors affect the level of employment. Under our form of economic organization, employment is largely determined by the prospect for profits. Profit prospects, in turn, are determined by prospective price-cost relationships and prospective volume of sales. Question: Do monetary, fiscal or tariff policies affect profit prospects in any way and thus indirectly affect employment or is the level of employment determined solely by other factors? If the answer is that monetary, fiscal and tariff policies have nothing to do with prospects for profits, and therefore nothing to do with employment, the sooner we forget about them

as factors affecting the level of economic activity the better. It's hard for me to believe this is the case.

With respect to the second conclusion, I should have thought that tariff policy would have had considerable to do with the availability of dollar exchange to other countries which in turn admittedly affects foreign demand for United States' farm products. I gather the British have rather strong views on this question at the present time.

Supplies of agricultural products certainly will have an important bearing on farm prices and returns (conclusion three). Bargaining conditions under which farm products are marketed will also have a bearing on farm prices and returns (conclusion four) although it is easy to over-estimate the possibility of increasing farm prices and returns by strengthening the bargaining position of producers. There are plenty of examples of this in the agricultural history of the United States.

Mr. Wells' final conclusion, also stated as Proposition 5, is that:

"The chances of maintaining a free, 'dynamic' economy—that is, of minimizing necessary controls or restrictions and maximizing the free enterprise area—are greatest in an expanding economy, probably under conditions where many of the partial price or wage levels are slowly rising over time."

I agree with this general view and also with what I take to be Mr. Wells' position that there is no reason to believe our "dynamic" days are over. In other words, there is hope.

CURRENT TRENDS IN AGRICULTURAL POLICY

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THIS discussion of current trends in agricultural policy will be confined to agricultural price policy. There are other agricultural policies more important in many respects than a price policy. A farm price support program will not solve the problems of the farmer. Agriculture is inter-dependent with the rest of the economy. A high level of business activity and production, world peace, international trade and a more stable general price level are some of the other problems much more important to agriculture. We must remember that in 1939, in spite of a maze of government programs, farm prices were lower than they had been in nearly 30 years, except for the worst years of the great depression.

We are going to have farm price programs. Although we have recently experienced the most prosperous period in American agriculture, we still find almost united support among farmers and law-makers for some kind of an agricultural price program. The differences of opinion today are not in whether there should be a program, but at what levels supports should apply. The basic question is, "Are we going to have a support program to protect agriculture against low prices—with comparatively free markets above these levels—or are we going to have governmentally administered farm prices?" As of today, August 8, 1949, it looks like there is about a 50-50 chance either way. For one who believes that the free market price has a useful function to perform in our society, that 50-50 chance is too close for comfort.

The current trend is toward higher peace-time supports in agriculture, which likely means more government regulation in agriculture. The trend toward more government is not confined only to agriculture, but encompasses other segments of our economy. Regulation, in itself, is not necessarily bad; but regulation which simply defers a problem or fails to accomplish constructive ends is another question.

The politician goes further than the farmer in demanding things of government which will lead to more and more controls in agriculture. Time after time the politician has exceeded the requests of farmers from government. A classic example is the current proposal

of the Secretary of Agriculture for high support prices, which was not requested by any of the major farm organizations.

It is not the purpose of this paper to point out the shortcomings of existing farm price programs. The major weaknesses, as I see them, are that they treat symptoms rather than causes; they will require entirely too many governmental controls; and that insufficient attention is given to programs to increase the demand for farm products. Serious consideration of the demand type of approach will likely have to wait until storage stocks become even larger, or a considerable slackening in demand occurs. This does not mean that economists should cease working on the problem. It is recognized that a price program will not materially aid that large segment of the people now classified as farmers but who produce very little.

All farm price programs have trends in common; whether the Agriculture Act of 1948, the Brannan Plan, a compromise, or any other likely farm price program. If farmers accept these programs, they should be prepared to accept many of the following trends along with them. The higher the price support, the quicker they will have to accept these things. Many of these trends are not to my liking, but they are presented as I see them.

(1) The trend is toward more—not less—government control in agriculture. There may be some exceptions as compared with the peak wartime control, but not when considered in terms of controls as they existed prior to the war. Falling prices will encourage more government controls. These controls may not be confined to production controls, but may extend to other phases of farming. A review of the provisions of sugar legislation may be some indication of what is ahead for other programs. The sugar legislation provides for varying payments according to the size of the producer; a smaller producer receiving a higher rate per hundredweight than the larger producer. Persons employed on the farm have to be paid wages deemed to be fair and reasonable by the Secretary of Agriculture. Deductions from the payments are made if child labor is used. Of course, farmers have to stay within their acreage allotments. It is very doubtful if farmers can accept such programs without also accepting controls.

(2) The program will accumulate large quantities of storage stocks. Personally, I have never worried about the necessity of accumulating reserves as long as we have price fixing programs.

The unsolved problem is not how to accumulate stocks, but how to get rid of them when they are priced above, or even at the prevailing market price, without running into political difficulties. This problem needs a tremendous amount of work.

Farm programs will always be in trouble from the standpoint of the economist. The reason farmers want these programs is that they do not want to accept a free market price. Consequently, when attempts are made to have other than a free market price, we will accumulate stocks and be faced with many of the other problems that arise when market prices are interfered with.

(3) In any agricultural price program that we are likely to have, there will be production controls. Practically every postwar program written for agriculture berated production controls. Where they were given any place at all, it was stated that they are to be used as a last line of defense. Such statements were made not only by the economists, but by high government officials and farm leaders. Yet, as was always evident to some who observed the developments closely, we have seen the last line of defense become the first line of defense.

Production controls are part and parcel of a farm price program. The business man cannot understand why the farmer keeps on producing if he has more than the market demands at a satisfactory price. His reaction is, "If you have too much, do as I do, cut down your production." This type of thinking is deep-seated in the business world. Nearly 80 percent of the Congress of the United States—which has the final say on these programs—is made up of lawyers and business men. The experience of the lawyers has been in serving business clients. When farmers go to Congress for relief, the logical reaction of the Congress is, "If you have too much, reduce production." I do not mean this as an endorsement of production controls or an implication that they are the best solution possible. It is simply a statement of reality.

These production controls will become compulsory with the passing of time. When voluntary controls fail to accomplish their attempted purpose, the next step is compulsory controls. This is already evident in some of the crops grown in the South. The tendency is not to abandon controls when they fail to work, but to add more and more controls. This poses some very interesting questions, such as: What do you do with the acreages taken out of production? Will these controls lead to an overall marketing quota for the entire

farm, rather than quotas for individual products, which permits the farmer to switch to other commodities?

The statement is often made that these programs are democratic because it takes a two-thirds approval by farmers before quotas become effective. This is a slightly different concept of democracy. While democracy is based upon majority rule, it is also based upon protection of the minority. These programs also place farmers in a situation where they will be penalized heavily unless they vote "right."

(4) There will be payments from the Federal treasury direct to farmers. These are called by various names; such as, parity payments, compensatory payments, production payments, or direct payments. It is doubtful if there is any other way to operate a program for some of our perishable commodities. Economists are not being realistic when they think direct payments would eliminate production controls. They may eliminate production controls if support levels are low enough. But with the kind of support levels currently being discussed, direct payments likely will be accompanied by production controls. If this is questioned, all you need to do is try to figure out a program to maintain a high support price on some of our major perishable commodities. Remember there may be a limitation of funds that Congress would be willing to appropriate in order to make up the difference between the market price and the support price. You will find that production controls will be necessary to reduce the cost of the program. You will also find that direct payments tend to make it easier to exercise controls over the non-cooperators than if attempts are made to stabilize prices by government purchases. With direct payments, checks can be withheld from the farmer who goes over his quotas or produces a wrong weight or type of product; while if market prices are maintained, it is more difficult to put the squeeze on the fellow who doesn't go along with the program.

(5) There will be more centralization in the administration of these price programs. Farmers and farm organizations have done a lot of talking about decentralized controls, yet the trend has been in the opposite direction. It is questionable if a control program can be de-centralized! Each area and community wants to get as high an allotment as possible. These allotments have to be determined on a national basis. Farm prices are determined nationally and internationally, not in a local region.

There is also a trend to give the Secretary of Agriculture more discretionary power. This trend has taken place even though many farmers and congressmen have insisted that formulas be set up to be used in administering these price programs. The administrator himself would be very happy to have formulas so he could go ahead and act, then pass the responsibility to Congress for the consequences of the program. Yet as these programs become more complex, it is increasingly difficult to write formulas which will apply to changing conditions; consequently, more discretion is being left to the administering offices.

(6) There is a trend in Government pricing programs to pay more attention to the unimportant crops, or at least those crops which account for a smaller percentage of the total income. Emphasis is often placed on the minor crops, such as peanuts, tobacco, raisins, tung oil, walnuts and honey. It is easier to administer a program on a relatively unimportant crop than it is to tackle some of the more complicated problems. Administrators like problems they can handle.

(7) There will be a trend towards greater use of marketing agreements. At present there are in the neighborhood of thirty milk orders or agreements in fluid milk markets. This number will likely increase if prices decline. It is interesting to observe how some folks bitterly criticize government farm programs in other fields, yet endorse milk orders, which contain as much, or more, price fixing than other farm price programs. The use of marketing agreements for fruits and vegetables, which now contain less price fixing than milk agreements, will likely increase, with more pricing provisions included.

For several years legislation has been introduced in Congress which would permit the operation of marketing agreements on any agricultural product. Legislation, if introduced into Congress year after year, quite often finds its way into law.

(8) The trend will likely be towards use of more export subsidies. This raises some very serious problems in the coordination of our domestic agricultural programs with our foreign policy. We all like to deal in terms of things as they should be, or as we would like to see them—which quite often is not the way they actually are. Perhaps we might give more thought to how to work these subsidies into foreign policy so that they will be of the least possible harm.

(9) The trend has been to start these programs at a comparative-

ly low support level and then increase them with the passing of time. There are indications that this trend may be reversed by starting the programs at a high level, accumulating a lot of controls, then lowering the support price but retaining the controls.

(10) These farm programs are becoming more and more political with the passing of time. The current developments are a prime example. At one time attempts were made to administer these programs on a bi-partisan basis. This is rapidly becoming extinct, even at the local level. This type of politics is confined not only to pricing programs, but extends to some of our other agricultural programs.

(11) The trend is toward a limitation of the size of the producer that may participate fully in the program. Secretary Brannan's plan contained such a limitation. It is not the first time that limitations have been suggested or enacted into law. This type of limitation may not be enacted this year, or for several years, but it is part and parcel of the deal. If the farmers want these programs, sooner or later they can expect differential treatment between the larger and smaller producers. In all likelihood, after such limitations are established, there will be a tendency to reduce the criteria of what constitutes a large farmer. This possibility may pose some interesting questions from the standpoint of efficient farm management.

The trends in current agricultural policy which I have discussed are trends as I see them—not as I would like them to be. As educators in the field of agricultural economics, we have a grave responsibility—responsibility to point out to farmers what is involved in various approaches. We should never cease in our efforts to influence these trends into more constructive channels.

COMMENTS ON AGRICULTURAL POLICY

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I QUOTE from the last few paragraphs of Dr. Galbraith's paper, "With the pattern of agricultural policy now being followed there is plenty of room for wisdom and for error. . . . The problems connected with current policy are not ones of kind but of amount. . . . The record amply indicates we can survive the several lines of policy with which farmers have sought to counter differential market power and quite possibly with benefit to the community as a whole."¹ This last statement is particularly reassuring following the detailed historical analysis presented. Two economists never agreed more fully than Dr. Galbraith and I on these points.

I should like to make a few interpretative comments on the current scene. I want to list the six major proposals for change in the administration's controversial proposals for modifying the 1948 Act. They are:

- (1) Drop the outdated 1910-1914 base period and shift to a recent farm income purchasing power goal for determining individual price supports.
- (2) Extend the mandatory price support list to include livestock and livestock products.
- (3) Implement price supports for perishable products with production (compensatory) payments.
- (4) Restrict the price support benefits in so far as possible to keep them from encouraging further concentration of farming operations in larger than family size units.
- (5) Include minimum conservation practices as one of the requirements for eligibility for price support benefits.
- (6) Support prices at roughly 18 to 30 percent above the minimum levels specified in Title II of the 1948 Agricultural Act.

Of Secretary Brannan's six major proposals for change, in the light of my analysis and I believe in the light of recommendations of committees of this Association, the first five are distinct improvements over existing legislation.

In common with almost all agricultural economists with whom I am acquainted, I have doubts about the desirability and feasibility of Secretary Brannan's proposal to support prices at 18 to 30 percent above the minimum levels specified in Title II of the

¹ A paper read before the American Farm Economic Meetings but withheld from publication to permit additional work on it.

1948 Agricultural Act. But I do not view this proposal with alarm. One doesn't need much political experience to conclude that there is little danger that price supports at too high a level will be adopted if direct government payments are used to implement any large part of them. The real danger is that Congress will not provide effective supports at any reasonable level for those products where direct payments are the only effective means of implementation. Congress simply will not appropriate the necessary funds.

But a more serious issue emerges from another sector, one in which there has been little controversy since 1938. I refer to the great reliance placed on production controls carried over from the 1938 Agricultural Act and extended but not improved in the 1948 Act. Now Secretary Brannan proposes to extend these same controls to additional products added to the price support list. The continuation and extension of production controls on the 1938 basis might be overlooked if one could be sure that all other alternatives had been thoroughly explored and found less satisfactory. Experience indicates that used in moderation as in the 1930's our American variety of production controls may have results precisely the opposite of those expected, increasing the output of agricultural products while conserving more of our soil resources.

In judging future performance we should look at the pedigree of these American production controls. They were conceived during the frustrating experiences of the Republican Farm Board days, born under emergency conditions following the Democratic Bank Holidays, and grew to maturity in the miraculously short period of five years between 1933 and 1938 in the most unhealthy environment of continued unemployment in the history of this country. Yet no one raised any objection when both the Republican leaders in 1948 and the Democratic leaders in 1949 proposed marrying price supports designed for periods of normal economic activity to an implementing program of such unhealthy family relations.

When I tell government administrators that these controls never have worked successfully (except perhaps for tobacco) they are inclined to agree with me. But then they begin talking about conservation acres—idle acres—similar to the provisions of the 1934 AAA contracts. Leaving aside the debatable question of whether or not we are likely to get farmer and public acceptance of effective and really restrictive over-all production control programs, I want to question their economic value to farmers. Many members of

this distinguished group have noted that effective farm production controls would have anti-welfare effects. I question even their economic value to the producers they are designed to help.

Short-run monopoly gains can be obtained from production controls when producers control a large proportion of the total supply coming on the market and when the demand for the product is inelastic. This latter requirement in effect means that the possibilities of product substitution are limited. How many agricultural products fall within the above classification? Tobacco, perhaps. Cotton, wheat and rice producers must sell a substantial share of their product in the world market. They do not control a large proportion of the world supplies. They cannot obtain economic gains from restricting production except as necessary to meet the requirements of government programs.

Cotton farmers have in effect said to me, "We are not asking for a government subsidy. Just allow us to set a fair price on cotton (92 percent of parity) and adopt production controls as necessary to maintain that price." Without a government subsidy on exports or some multiple price plan in addition, I am confident their total income from cotton would be smaller as a result of their production restrictions. The same is true for wheat and rice although the problem of product substitution is much greater for cotton than for these two products. In all three cases it is unrealistic and uneconomic for the producers of these products to restrict production in the near future to the amount which would sell in the domestic market at the desired price. Domestic producers of these products do not have the machinery for raising world price levels.

The situation for corn at first appears to be different. The entire crop is domestically consumed and analyses indicate the demand curve to be inelastic. Surely farmers can obtain short-run gains by restricting production under such circumstances, but here again we run into product substitution and even more important, demand for meat animals, the end product of most corn, is only slightly inelastic. On the technical side a little improvement in feed crop production or feeding techniques, would offset any moderate production restrictions.

The point I want to make is that if farmers were given the machinery to operate production controls—and no other machinery for stabilizing and increasing their incomes—while they might stabilize their income somewhat they would almost certainly lower

it, even in the relatively short-run. The evidence is overwhelmingly against the possibility that effective production controls would obtain long-run economic gains for farmers. Why then do we use production controls as our major method of implementing price supports? Before outlining what I believe to be a more promising method of implementing price supports let me make a few background statements.

- (1) Within the foreseeable future farmers will be producing and selling in an environment of high industrial activity. Specifically, high levels of wages, employment, and economic activity by any prewar standards are far more probable than a return to the levels of unemployment and business activity of the decade before World War II.
- (2) Farm price supports are now an accepted part of the American economic scene, and in one form or another may be expected to continue to play an important part in our economy throughout the lifetime of the youngest member of this audience.
- (3) They will be extended to additional farm products as rapidly as is politically and economically feasible.
- (4) They will be maintained at as high a level as permitted by the force of economic events. (Most of the political pressure at the present time is in the direction of higher price supports, with the notable exception of the Farm Bureau and the farm economists.)
- (5) We will continue to separate domestic from world prices for export crops much of the time, at least until some new world trade considerations present their appearance.

These five propositions constitute my frame of reference when considering policies or programs for implementing price supports. Another aspect of my frame of reference is a bias toward agricultural policies which require as little direct government interference as possible with citizen actions—actions of either producers or consumers. Given these propositions and my bias toward minimum government controls I find myself exploring a program of implementing price supports similar to what I believe some people vaguely call the Babcock or livestock program.

Farmers and farm leaders who lived through the depression of the 1930's fear that we cannot maintain over-all favorable farm prices and incomes and utilize our agricultural plant to its full capacity. This of course is the crucial question. Although the big feed crops of 1948 and 1949 have raised some doubts in my own mind I still believe that we can market all we can produce at prices which will permit us to maintain a standard of living for families

on efficient farming units comparable to the standard of living of non-farm families if: (1) our present domestic buying power is maintained and continues to grow as it should in an expanding economy; (2) if we maintain postwar foreign markets at reasonable levels, and (3) if we will devise and maintain appropriate economic incentives (prices and supplementary devices) and shift our surplus resources in our major export crop areas (mainly wheat and cotton) into the production of meat animals and dairy products.

I am not yet ready to subscribe to the theory of total over-production for agriculture.

Let me restate my basic position in simpler terms. I do not believe that the loss of foreign markets and the rapid rate of technological progress is going to give us total over-production in agriculture in an economic sense. I admit the situation looks threatening—and I may be wrong. But we should remember several things—first, we have no assurance that these bumper crops in the Western Cornbelt and the Plains states will continue—second, the domestic market for our farm products in terms of purchasing power in the hands of non-farm people has tripled since the prewar years while farm production had increased around 40 percent—and finally, the shrinkage to a more normal size of the abnormally large foreign markets of recent years, if all the resources released were diverted to livestock production, would only increase livestock output by 5 to 6 percent.²

In the political debate following the announcement of the new proposals many people seem to have overlooked a key element in them. This was the proposal to support livestock prices at favorable levels relative to other farm prices. This is a really new approach in the price support field, one which holds promise of encouraging more rapid progress toward our national nutritional goals, our soil conservation goals and continued full employment at satisfactory prices for our American agricultural resources. But in the heat of the controversy over the non-economic issues, it looks very much as though the baby has been thrown out with the bath water. The compromise bill which Senator Anderson introduced, and which already has gone through many revisions now proposes to:

² An annual surplus of wheat of 975 million bushels if converted into livestock products would increase livestock production 4 percent—See "What Will We Do with Our Wheat Surplus?" by W. W. Wilcox, July 1949, Farm Policy Forum. Resources shifted out of cotton and other export crops would be less than half as important as the wheat.

- (1) Raise the minimum support level range for basic commodities to 75 to 90 percent of parity with 90% supports required the first year; acreage allotments are in effect regardless of the supply of the product.
- (2) Include hired labor costs in the prices paid index, thereby raising all parity prices 5 to 6 percent at the present time.
- (3) Include dairy products, potatoes, and perhaps one or two other commodities in the mandatory support list. Specific authorization for the use of production payments on livestock was included in the first draft of the bill but has been omitted in later drafts.

Political forecasters predict that this compromise measure will pass the Senate and form the basis of a compromise with the House of Representatives. When one applies economic criteria he finds that this compromise provides as high or higher price supports on the basic crops (the crops in which market surpluses already exist) as do Secretary Brannan's proposals. This new compromise measure not only fails to include livestock products in the mandatory support list which may not be important, but as a result of the legislative history of this bill, specifically dropping the production payments feature, it is more restrictive on livestock price supports than the 1948 Act. (The 1948 Agricultural Act authorized the use of direct payments as one of the means of implementing supports and permitted price support operations on the non-basic commodities at the same levels as required and permitted on the basic commodities—up to 90 percent of parity.) Thus it seems probable that we will enter 1950 with legislation more likely to intensify and prolong existing maladjustments within our agricultural economy than either the existing legislation or Secretary Brannan's proposals.

If it were politically feasible, from a resource use and national welfare standpoint, the commodity groupings should be reversed. Livestock products should be supported at moderately high levels with a lower support level on the basic crops, but this might not give sufficient income protection to the producers of crops in excess supply. Unquestionably any system of price supports must take into account the price and income situation for individual producer groups. We are apparently committed to maintaining fairly satisfactory incomes for cotton producers, e.g., while using other means of encouraging them to shift into other lines of production. In terms of politically acceptable alternatives, relatively high price supports and acreage allotments for key surplus non-feed crops

may be the best program available. If acreage allotments for each of these surplus corps were set in terms of integrated diversion goals, rather than as at present by independent market supply formulas we would have the beginning of a farm program adapted for the economic times ahead of us rather than our present depression-dated model.

We have lost valuable ground in our current controversy. I would like to see administration and farm organization leaders get together and work out a program of price supports and implementing programs on as wide a basis and at an over-all level as high as *but no higher* than is consistent with full farm production, assuming that we will have the domestic and world purchasing power to take that volume of production at satisfactory prices except for brief cyclical periods.

But as a precautionary measure I would like to have them set up plans for dealing with the situation in case the weather and rapid technological progress do give us more total volume of agricultural products than can be sold at prices which will give farmers satisfactory incomes in relation to the cost of things they buy. Production controls should be considered on their merits, but even under these conditions I am confident that other implementing programs hold much greater promise both for farmers and for the general public. I refer particularly to the extension of multiple and class price plans for our major export and feed grain crops and class prices for some of our key foods. I hope measures of this type can be worked out in such a way as to avoid the need for direct government appropriations to finance them. Farmers will have little confidence in a program that requires large government appropriations each year. And with good reason. Because of this political consideration I place near the bottom of my list of implementing programs the Production Payment Plan we have heard so much about the last few months. But I place even lower the production controls as spelled out in the 1938 Act and as continued in existing legislation.

Parenthetically let me mention that I see no economic basis for the widespread belief that artificially maintained total farm income at above free market levels leads to inefficient national resource use. I am aware that orthodox equilibrium analysis reaches this conclusion, but equilibrium analysis does not take into consideration the dynamics of technological progress and labor mobility.

This point is discussed further in a note in the August issue of the JOURNAL. At this time I merely want to emphasize that the important consideration is relative prices and other economic incentives within agriculture. If these are kept in the right relation to each other and excess resources are channelled into the production of products having the most elastic demand schedules, I have no fear of adverse resource use effects resulting from modest transfers of income from non-farmers to farmers. National resource use in the United States is likely to be more efficient under such a program using either T. W. Schultz' or Bushrod Allin's definition of efficiency.

Returning again to the main theme, I would like to have administration and farm organization leaders work out a program for a third possible situation. They should have a price support and implementing program ready in the event serious unemployment develops. Their first program should be designed to care adequately for the usual business cycle and weather fluctuations, but a program adequate for such circumstances may not be adapted for dealing with a major depression. A separate program or a series of supplements may be needed.

Actually the working out of a program for this third situation should be relatively simple for we have mistakenly devoted almost all our postwar planning efforts to this problem.

But the crying need at the present time is for a system of price supports adapted for functioning in periods of a high level of economic activity. The critical consideration here is facilitating some long-time shifts in resource use, particularly away from current acreages of cotton and wheat toward larger acreages of grasses and feed crops and meat animal and dairy production.

FOREIGN TRADE POLICY—WHICH WAY?*

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THE favorite bit of advice offered today on our international affairs is that "we must be realistic and start from where we are." This is inescapable. We cannot move from where we are not. If we like it where we are and if we like what we have, moving elsewhere may have no appeal. If we do not, we ought to be concerned not merely with moving but with finding a road which gives real promise of leading to improvement. Even those who may be satisfied with the status quo will do well to do some appraising. They may find that the present is not as attractive as they may have assumed. They may, in fact, discover that staying where they are may involve some troublesome problems or perhaps be impossible.

Where are we? World trade, like the Traveller among the Lilliputians, finds itself bound hand and foot by tariffs, quotas, exchange controls, state trading, and dollar shortages. Fear of war, political and economic instability and conflict between ideologies cloud the skies. The present situation is to a major extent the inheritance of two world wars and a serious world-wide depression all within the span of a single generation. These occurrences have disrupted production, markets and trade relations.

What have we done and what are we doing to meet this situation? The United States assumed a modest degree of leadership in the direction of freeing trade in the adoption of the reciprocal trade program in 1934 and its continuation since then. While it is impossible to appraise all the results of this program with nicety, there is reason for assuming that it has played a significant part in slowing down and, to some extent, in reversing the world trend towards economic nationalism. The lend-lease program adopted before our entry into the war was a more realistic facing of facts than the war loans of the previous war. While UNRRA fell short of the expectations of many, it did help to continue a flow of goods for a time after the lend-lease program ended. The efforts at international cooperation represented by the United Nations have relied heavily on our leadership. The Marshall plan is a very frank facing of the

* Miscellaneous Journal series 671, Minnesota Agricultural Experiment Station.

fact that we do have a concern with recovery of production elsewhere and the development and maintenance of world trade.

These programs surely point to our interest in international cooperation. Whether that concern is sufficiently strong to withstand pressures of short-run domestic interests which may run counter to it is something still to be demonstrated.

What are the bases of our international interests? The growing realization that the United States is not a self-sufficient nation surely is one of them. Our production in certain lines is expanded beyond the capacity of the domestic market so we have real need for export markets for both agricultural and industrial products. On the other side, we remain dependent on imports of other goods. A feature of our international trade is that to a considerable extent imports consist of raw materials from the South Pacific and Latin America, while exports tend to go more largely to Europe. Bilateral trading does not fit our situation. Multilateral trade is necessary if our exports are to pay for our imports.

There is a healthy skepticism among Americans over state trading. We have seen how states may ignore costs and use trade to help attain political or military ends. Many Americans believe strongly in leaving as much economic activity as possible in private hands. Foreign and domestic trade are not separate fields but different facets of the same thing. Control in one sector leads to control in the other. In view of this, it is unrealistic to expect freedom of operation for private endeavor on the domestic scene if actual carrying on of international trade is assigned to the state. This does not mean that governments have no function to play in international trading. Rules for playing the game are essential. It is one thing, however, to regulate trade through tariffs, exchange rates, monetary measures and the like; it is something else to carry on actual trading itself.

Among those who have any real understanding of the conditions confronting the world after the war, there is extensive agreement that the European Recovery Program has a vital function to perform. Both the production and buying power of war-torn countries were seriously disrupted. There was immediate need for improvement in the food situation and a longer-run need for the reestablishment of production and an improvement in productive capacity. In spite of short supplies of such vital materials as steel in the United States, our supplies of both food and raw materials repre-

sented abundance in comparison with Western Europe. The need was urgent; the available means with which to purchase in our markets were extremely limited.

The Marshall plan represented a realistic recognition of this problem. It saw that the solution called for some direct aid from the United States but that such aid would become primarily relief unless the European nations themselves assumed major responsibility for working out solutions to their difficulties. While the program necessarily has had to include some direct relief its major feature is a recognition of interdependence among nations in the modern world. The program rests on a hard core of reality of self-interest as far as the United States is concerned. We are beneficiaries as well as benefactors. Our well-being is inseparably linked with that of the rest of the world. Prospects for enduring peace are vitally affected by recovery of production and trade the world over.

Our questions with regard to the ERP are not so much over its objectives as over whether it is going to do enough. Production will not be fully restored and problems of dollar shortages will not all be solved by the time the present program runs out. Realistic exchange relationships need to be established. The nations involved will have to be ready to buy as well as to sell if the program is going to achieve success. Production efficiencies need improvement. Plants need rebuilding and modernization. Too much political instability still remains in some of the countries. Nor is it clear that everyone in those countries is ready to face up to the hard, cold facts which confront them. Governments are not too anxious to dwell on such facts because they are not certain of the effect on elections. The division of Europe into East and West and the sparring for power and influence which is under way create additional difficulties. How to fit Germany, particularly handled as two rather than as one economic unit, is not the least of the posers. The pace of recovery in Western Germany creates fear of competition which adds complications.

The International Monetary Fund, the International Bank for Reconstruction and Development and other forms of cooperation under the United Nations promise to be of material aid in trade and other economic relations under more normal conditions. They are not well suited to playing a major role in getting out of present dilemmas. The International Trade Organization, while not fully

established as yet, represents at least a step in the direction of providing machinery for working out better trade relations in the future. The ITO, however, is under fire from some who think that it goes entirely too far and from others who see too many weak spots and loopholes in its present organization and charter.

Naturally, enthusiasm for ITO is not to be expected on the part of those who look with disfavor on efforts to expand trade. How much merit there is to the objections of others who feel that its charter has been unduly and unnecessarily weakened by too many concessions is a matter of opinion. Much depends on how the participating nations will employ the ITO. If they use it in sincere efforts to improve trade relations and seek every means to increase its effectiveness, valuable results should flow from it. On the other hand, if they fall back on its escape clauses and protective devices to avoid making needed adjustments, the ITO might interfere with rather than aid trade expansion and recovery. This is another spot where heavy responsibility rests on the United States to provide effective leadership.

This recital while incomplete shows that the nations of the world face Herculean tasks in adjusting their economies to more effective international trade and cooperation in the years ahead. One very grave danger is that the problems of the moment may loom so large that the temptation to yield to expediency may become well-nigh irresistible. Unfortunately, such yielding will hinder rather than aid the longer-run adjustments. If persisted in, short-run expediency becomes long-run policy.

Because of her importance in world trade and the magnitude of her present-day economic problems, Great Britain exemplifies in marked degree problems which nations face today in living with the world. Great Britain could not have attained a position of prominence in the world without trade.

There may be more than a modicum of truth in the assertion that various British lines of production have not kept pace with competitors in other lands in efficiency of operation. Wars, however, certainly have played a very important part in bringing the problems of Great Britain to the fore. This is especially true of World War II. British production had to be shifted from civilian manufactures for domestic consumption and export to war materials. This shift reduced very decidedly the means for paying for imports. Moreover, available foreign exchange had to be used increasingly

for war materials. Liquidation of foreign investments provided added purchasing means for the time being but that process meant a loss of means of payment for imports later. Before the war, Great Britain lived on current production plus returns on accumulated savings. After the war, it has been limited largely to current production and part of that production necessarily has been directed to healing the wounds of war. The British people have had to deny themselves many things of foreign origin because they have been short of foreign exchange, especially dollars. They also have been forced to get along without some things of domestic manufacture because it has been necessary to push production for export rather than to concentrate on production for home needs. Clothing has remained short because woolens represented a commodity suitable for export. British cars have been going abroad rather than being sold to home buyers. In spite of this, the foreign exchange and domestic production have not been adequate to meet all needs. The limited supply of such important foods as meats and fats is one illustration of this condition. The "austerity" program in vogue in Great Britain rests on some fundamental dislocations rather than being something which has been hatched out in the fertile brain of Sir Stafford Cripps or something which can be laid at the door of the Labour Government. The austerity program, however, is only a way of living with a problem, not a remedy for it. The remedy lies in procuring the means for satisfying wants more fully through greater and more efficient production and its corollary, the recovery and expansion of trade.

The dilemma of Great Britain makes bilateral trading arrangements appeal to her as a way of getting out of difficulty, at least temporarily. One may grant the basis of such an appeal and still be concerned lest expediency be permitted to become the bricks out of which longer-run policy will be built. The employment of such devices may be contagious and the result may be that of fettering trade with so many of these arrangements that a return to anything resembling real multilateral trade may become a forlorn hope. If this should be the outcome, losses in terms of lowered levels of living and doubts over prospects for enduring peace might become staggering.

Americans who object to financial aid to Great Britain on the grounds that nationalization of some industries have taken place in that country need to recognize that the present Labour Govern-

ment did not create the basic conditions now calling for aid, and that from our standpoint what is done and how it is accomplished are much more important than who does the job. But it may be well to point out that on the other side socialization by itself will not automatically produce the changes required. Unless the British people and the British economy accept frankly the fact that lower levels of living will continue until a return to higher levels is earned by greater and more efficient production and trade, difficulties will increase. If the British people expect and demand returns that are not available from production, that nation like any other will soon find itself outdistanced by countries which face economic facts more realistically. The appeal of the "welfare state" lies in part on a concentration of attention on benefits rather than on costs. As a result the margin separating the "welfare state" from the "handout state" may be narrow. While some individuals may find it possible to get something for nothing, that is, at someone else's expense, a nation can hardly hope to do so for any length of time.

Great Britain attained its position of leadership in the world in a considerable measure because of its role in international trade. It is difficult to see how it can regain such a position without extensive restoration of multilateral trade. While the urgency of immediate problems fosters bilateralism, the British must share the concern of Americans over how to restore trade to a multilateral basis at the earliest possible time. To be sure, devaluing the pound and other steps necessary to a freer movement of goods internationally involve risks. This is what led *Fortune* (August, 1949) to ask, "Does Cripps perhaps really prefer bilateralism to risk? That is the key question about British policy and it is asked with growing insistence in Washington, in Britain, and in Europe." Those who view the risks as "intolerable" may do well to ponder the longer run consequences which may be expected to flow from a failure to face the present situation.

It would be unfair to imply that Great Britain is the only nation hesitant about taking the steps necessary to economic and trade recovery. The nations of Europe appear eager to pin their hopes on a future involving sales to their neighbors but less ready to adjust their own operations in accord with the basic principles of comparative advantage. Courageous and far-seeing action on the part of European nations generally is essential. The natural tendency is to

think primarily in terms of domestic and internal problems and solutions. It is difficult to take an optimistic view of European and world prospects unless effective action is taken to integrate economic activities. Perhaps it is too much to ask at this time for the establishment of a "United States of Western Europe" in its full political and economic import. However, it should not be asking too much of Europeans that they bend every effort toward restoring trade as well as production and that they face realistically and courageously such problems as those involved in achieving stable currency exchange relationships. Some Americans who are impatient with reluctance of Europeans to make needed adjustments contend that "he who pays the fiddler may call the tune" and insist that we should make compliance with the specific program we desire a condition of aid. However, if we prescribe the details of action, the program and the responsibility for its success or failure become ours rather than being cooperative.

While recognizing the importance of the attitudes and actions of other nations, Americans will do well to realize that our own actions, programs and policies may play an even more significant role in determining world trade policies of the future. As the world's leading nation, our concern over world peace and order is greater than that of any other nation. We have more to lose. Because of our position, our leadership is extremely influential. Recognition of this fact adds to our sense of responsibility. Self-interest focuses our attention on the need for export outlets in the years ahead and war helped to drive home to us our dependence on certain imports. The question of dollar shortage is prominent in international discussions of the day. The problem of dollar shortage is a consequence rather than a cause of international difficulties. It will not be overcome unless other countries can and will produce goods and services with which to obtain dollar exchange and those dollars cannot be obtained by them unless we stand ready to purchase goods and services from them. Our attitude towards imports, therefore, is a matter of prime importance.

The United States could not have developed as rapidly and effectively as it did if capital had not been available to us from other parts of the world. The shoe is now on the other foot. This country has reached the point where we have capital available for productive investment in other parts of the world. However, inducements for making such investments will be lacking unless there are good

prospects for obtaining and collecting returns on such investments through imports. This is a factor which we must bear in mind in our future trade policies. Our aim should be to do our part in helping develop a world of enduring peace, of stable governments, and of effective living together among nations, if we are to have the levels of living which resources make attainable for ourselves and for the world at large.

A common tendency is to think about our foreign and domestic programs as though they were separate and distinct activities which can be kept apart in water-tight compartments. This, of course, is not true. An important aspect of our policy with respect to foreign trade consequently needs to be a recognition of the fact that we cannot be unmindful of the effects which domestic programs may have on the rest of the world and our relations to it. Too many Americans appear to believe that what we do on the home front is strictly our business and consequently of no concern to anyone else. That view is entirely too narrow.

If we endeavor to maintain an artificially high price or wage structure here at home, it will be necessary to put up barriers to competition from other countries. The cry will go up that we must "protect" the American level of living and the American wage scale. It still is not recognized that levels of living and of real wages depend upon productivity, not tariff protection and trade restriction. We have difficulty in seeing in full measure the competitive problems created for other nations by our comparative skill and efficiency of production in many lines. It is anomalous for the United States under existing circumstances to be so fearful of trade.

There is direct conflict between our farm price support and our international policies. As long as we endeavor to maintain an arbitrary domestic price structure for given farm commodities, part of the program must be that of keeping imports from coming in to break down the scheme and bankrupt the treasury. Agricultural price support leads to production curtailment and Americans will hardly stand by watching imports come in while some of our most productive resources are kept in enforced idleness or devoted to less than their best uses.

The difficulties involved in achieving effective production curtailment result in the accumulation of surpluses of farm products when arbitrarily high price levels are maintained. A common assumption

is that a convenient and easy method of disposal for such surpluses lies in selling them abroad at whatever prices they will bring. This rests on the belief that there is a world market standing ready to absorb anything and everything we may see fit to turn loose on it. Such an assumption is most unrealistic in the present-day world. It overlooks entirely the knotty problem of dollar shortages. It does not face up to the vast array of trade barriers found in the world today.

Selling products abroad at less than their domestic price is a form of dumping. The nations of the world, including the United States, have restrictions against this practice. We have been quick to employ countervailing duties when products were dumped on us to create situations which we viewed as unfair competition for our own producers. Aside from that difficulty, a question also may be raised with respect to the soundness of a policy which aims to provide others with our products at lower prices than those charged our own consumers. This seems to be a doubtful way to safeguard American levels of living.

Moreover, any program involving dumping of American surpluses abroad to maintain an artificial price structure at home is inevitably nationalistic in nature. As previously suggested, barriers will have to be raised to keep foreign products from sharing in those artificially high prices. In addition, barriers will become necessary to keep dumped products from returning to our markets. This includes not only raw materials but products made from them. For example, if we dump cotton, it must be kept from making the return trip and in addition our textile industry will demand protection against foreign competition on the grounds that cotton mills abroad get American cotton at a lower price. Any extensive dumping of food products will lead to widespread demands for higher trade barriers on the grounds that foreign competitors have an advantage in resulting lower living costs for their workers. Americans have not yet faced frankly the inherent conflict between our programs of price supports and our international policies. This observation also applies to some of our officials and legislators who are bringing forth proposals involving price support.

Perhaps it will be suggested at this point that international commodity agreements provide the solution for this dilemma. While there is room for questioning commodity agreements, one is not justified in going so far as to say that there is no opportunity

at all for their employment. For example, if nations with food or other supplies to spare get together on a program of sharing these supplies with backward nations having need but lacking means of satisfying such need, the program may be very much worth while both on humanitarian grounds and as a way to improve productivity. But the possibility of using commodity agreements for such laudable purposes should not silence us in raising questions regarding other types of such agreements. Have we given sufficient consideration to the nature and consequences of these agreements? We apparently dislike and distrust cartel arrangements but are not some of the proposed international commodity arrangements glorified cartels? Markets are to be divided, rights to supply and share are to be assigned, and price limits are to be established. Will not such arrangements tend to encourage further encroachment by the state in the actual handling of trading? Will they require government controls of supplies and production to make them effective? Will they help or hinder desirable adjustments of production and of trade arrangements? Are we not selling commodity agreements to export nations on the argument that they assure a market and to consuming nations on the grounds that they assure them a supply, without sufficient examination of the consequences of such arrangements on the international trade picture and the relations of governments thereto? Surely, these questions are of sufficient merit to have our most careful study and attention before we embark on a program involving extensive reliance on commodity agreements.

Pressures being put on ECA and proposals in Congress relating to the uses of funds made available to it indicate a disturbing trend in our thinking. One of the favorite ways employed by enemies of the European Recovery Program in attempting to discredit it has been to charge that its major purpose is that of bolstering the economy of the United States by creating markets for surpluses. To the extent we yield to these pressures, we will give substance to those criticisms. Any such development is certain to create grave doubt and suspicion in the minds of others regarding the sincerity of our purposes. It will weaken our effectiveness as a leader.

If the ERP is to accomplish its objectives, the funds must be husbanded for use in purchasing goods which are most essential for economic recovery and for reestablishment of more normal

interchange and not be misappropriated to provide outlets for products merely because they happen to be in surplus in an artificially rigged domestic market.

Research in marketing is a center of interest at present. Surely, international trade is of such importance to our future that basic problems relating thereto are deserving of a prominent place among the subjects selected for study. In the work now under way, we are giving more attention to finding immediate markets abroad than to a fundamental study of what is needed for the development of permanent markets. Do we have an adequate picture of what international trade will be like after ECA completes its operations? What kinds and amounts of products may we hope to export? What will our import picture be like? How may we meet and solve problems of dollar shortages, establish stable foreign exchange relationships and restore convertibility of currencies? What are the requirements for and problems involved in a return to a greater volume of multilateral trade? What are the international ramifications of various domestic programs and proposals? Further light on these and a host of other problems is needed as guides for both our foreign and domestic policy.

An observation which a discussion of the preceding type may be expected to evoke from some quarters is that the views here expressed arise from a nostalgic longing for a return to the days of yore. But it is not a case of going back to something but a question of what we are going forward to. If we are to be fatalists and assume that the peoples of the world can do nothing to alter the stream of events, then we might as well fold our hands and wait for the worst to happen. Few of us will subscribe to any such defeatism. We will instead recognize that we can do something about shaping the course of future events and that it behooves us to study problems and consequences carefully in order that we may act intelligently. Only to the extent we do so will the future bring a satisfactory answer to the question "Foreign Trade Policy—Which Way?"

SOME FURTHER WORLD TRADE PROBLEMS—A REVIEW OF PROFESSOR JESNESS' PAPER

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PROFESSOR Jesness points out that there are two roads ahead of us in foreign trade policy, an easy but purposeless road marked expediency, and a more difficult road which appears to backtrack but, he assures us, will lead to a great plain of multilateral trade and stable world relationships. A dozen years ago we were faced with a similar choice, yes, and even two dozen and three dozen years ago. Is it any easier with today's vast proliferation of trade restrictions to choose the high and difficult road of reduced trade barriers? Can we be any more hopeful now that domestic and international prices can be brought together?

It is appropriate to diagnose the illnesses of free multilateral trade. Why did it break down? Professor Jesness has mentioned two wars and a depression, but let us be more specific. First, and of prime importance, is the impact of the international business cycle, with war important in affecting one phase of the cycle. Many, many restrictive measures were adopted in efforts to limit the extent to which deflation affected a particular country—an export-the-depression sort of phenomenon. Second in importance are the secular changes in the conditions of consumption and production frequently becoming most serious in a depression. Examples would be the gradual expansion of synthetic fibers substituting for cotton or a continued rapid increase in rubber production while consumption increased less rapidly. To counteract such effects, interferences with trade such as the Stevenson Plan and the International Wheat Agreement were enacted. Third is the fear of war and food shortages and consequent willingness to accept nationalistic programs of self-sufficiency. Fourth are the efforts of one group or another to improve its price and terms of trade relative to other goods and factors through using tariffs, quotas, and the whole array of other restrictions. We tend to think of the fourth and forget that the other three frequently have set the stage so the fourth could operate. Trade restrictions are not solely the result of the activity of selfish pressure groups.

Is there anything in the present international situation to give us hope that these same forces will not once again draw the curtain

on our efforts to reestablish multilateral trade? Are we even making progress towards developing ideas and institutions attacking these problems? The business cycle is an important key to the whole situation yet none of the specialized international agencies has the cyclical problem as its major obligation. We are operating on an *ad hoc* basis attempting to attain stability primarily through price on a commodity by commodity basis without really facing the main issues. At one stage, the ITO charter gave some consideration to it but in the final version, the wording was watered down to innocuous form, in spite of the protests of Great Britain and other European friends.

I would like to suggest that it is high time we do some exploratory analysis based on the assumption that domestic price support programs will be with us for a long time to come. Therefore, it behooves us to try to chart a better road, and to put some purpose in the general direction of expediency, at least to learn more about the several alternatives along that road. It is possible that such mapping will discover a circuitous but perhaps politically easier route which eventually approaches the plateau of multilateralism.

A major contribution the United States can make to a long time sound world order is to maintain a stable and relatively high level of employment and purchasing power. The analysis of this problem requires a kit of tools and a body of doctrine which has not been well-integrated with the traditional neoclassical theory and hence has little to say about efficient international resource allocation. Many, of course, claim greater realism for this Keynesian analysis. It is easier to develop programs to deal with the business cycle on a national level, and such programs will not necessarily mesh with policies striving to make the international price system function; in fact policy may be developed more easily if the various national price systems are partially insulated from each other. There is much to be gained by focussing on policies which have the maximum international counter-cyclical effects rather than on international allocation of resources. International investment, for example, in many ways has been an upsetting rather than an equilibrating influence. It is questionable whether free international trade, the free flow of investment and full employment are mutually compatible within the framework of our present economic institutions. There is a tremendous waste of resources in a depression, and the world could well afford a little

mal-allocation of resources if a depression were thereby prevented. It would, of course, be better to avoid both.

Let me digress for a moment. In analyzing American agricultural policy at the domestic level, many of us have found it exceedingly useful to separate the two problems of resource allocation and income distribution. Income goals have been used to sell programs to Congress and to the people, programs which gain their objectives through modifying resource allocation. By separating these two problems far more rigorous analysis is possible, which frequently leads to pertinent suggestions for the improvement of programs. The study of resource allocation in agriculture is the heart of our field of work. To make policy conclusions in this area the main assumption is that people prefer an efficient combination of resources to an inefficient combination, a relatively easy assumption. While resource allocation affects income distribution, we have found it desirable to study income distribution separately and later to put the two together. The assumptions necessary for policy conclusions with reference to income distribution are more controversial. Usually we do not come to an agreement, but rather limit our disagreement by attacking only the extreme variations in income which are socially unacceptable.

You are all familiar with the conclusions arrived at by these methods of analysis. Agricultural and other public programs should function in such a way that the price system can operate effectively in its proper role—that of allocating resources in relation to the values of the marginal products. A considerable variation in the personal income distribution may result, but in general, the net social product is maximized. If this resulting income distribution does not fit the pattern that society deems desirable, other measures are suggested to redistribute the social product. Progressive income taxes, public education, and relief measures are well-known examples of such measures, with direct payments a more recent addition.

In the international field we have not really applied this two way analysis rigorously. Attention has been concentrated on the allocation of resources, and on somehow reestablishing the international price system. But in the last two decades, we have seen how all nations have been unwilling to permit the price system to function, primarily because the resultant distribution of income between nations and within nations was unacceptable to them.

Various steps were taken in attempts to improve their income situation, even though many recognized that the net world social product was thereby diminished. Yet, in our analytical work, we have unconsciously said, "Whatever international distribution of income results from efficient international resource allocation is a desirable and proper distribution." If the rubber producers of Malaya find the price of rubber declining from 25 to five or 10 cents per pound, they will be strongly tempted to limit marketings so as to raise prices and maintain incomes. The classical free trade answer opposes this and suggests that other lines of production should be developed. The long-run world social product would be maximized. To the rubber producer this is no answer at all since rubber is his source of income. Farmers, laborers, and others have refused to accept such *dicta* on the national scene; we can hardly blame nations and policy makers for rejecting it internationally.

Studies by Colin Clark¹ suggest that the differences in national income between industrial and primary producing countries are becoming wider. Yet we have not developed any institutions specifically designed to deal with this problem. We have adopted measures which change the international distribution of income, some consciously and others unconsciously. Professor Jesness mentioned Lend-Lease, UNRRA, and the Marshall Plan, which, through exporting food and capital goods divert income from American to foreign recipients. But we have been telling ourselves that these were loans or temporary measures until reconstruction has been largely completed. Affecting income distribution in the reverse direction are the price support programs which we and others have put into practice. Assume for the moment that such a program in the United States supports wheat at 25 cents above the equilibrium price. Within the probable elasticities of supply and demand in the short run, income is transferred from the wheat-consuming to the wheat-producing countries including ourselves. In the long run changes in resource allocation would expand wheat production in most countries, and income would be transferred from wheat importing countries to wheat exporting countries or from wheat consumers to wheat producers in the foreign consuming countries.

It is interesting to discuss the effects of an export subsidy by the

¹ In *Conditions of Economic Progress*. See also T. W. Schultz, *Food, Agriculture, and Trade*, this JOURNAL, February, 1947.

United States of exactly 25 cents per bushel. Under the circumstances above, it would neutralize completely the effects of the domestic price support program on international resource allocation and on international income distribution. An export subsidy such as this would keep the price support program entirely within the United States, except as wheat farmers in the United States might spend their additional income differently for imported goods than those who would otherwise have received the income. Thus if we assume a continued price support program probable, we find a role for the export subsidy. However, foreign nations would still consider the 25 cents to be an export subsidy against which retaliation would be justified. And obviously it would be difficult to determine the exact amount needed to offset domestic price programs, or once in operation, to keep such subsidies from becoming several times the amount needed to neutralize them internationally.

These considerations suggest that we need to face squarely on a multilateral basis the questions, "What sort of international distribution of income is socially desirable? How far and in what way can the United States contribute to this desirable income distribution?" We and other nations have an income tax designed to redistribute income among the people within our national boundaries. Logically, is there any reason why this redistribution should stop there?

We must recognize and deal with programs such as the now discarded Brazilian valorization of coffee, the West African Cacao Marketing Boards, or our own agricultural programs. If we were prepared to consider supplementary world income programs on a permanent basis, it could ease the problem of providing for a more efficient international distribution of resources. In the main, the United States has avoided using its economic strength as an international political weapon. If we were to pass a tariff on coffee, cocoa, and other tropical agricultural products to be applied as other countries discriminate against our goods, this bargaining weapon could be very effective in limiting the efforts of many Latin American countries in subsidizing competitive agricultural and industrial development. But such a weapon is dangerous and if unsuccessful, would end by increasing the price American consumers pay for these imported goods. Furthermore, as Professor Jesness points out, such bilateral trading does not serve us well with our major customers in other areas. A safer weapon though still sub-

ject to considerable dangers of political manipulation and favoritism and to legislative criticism, would be an income supplement between nations recognized as such. Such income supplements might operate through any of the familiar foreign aid programs already in operation but all integrated on an international basis and across commodities to move toward definite specific goals of social action; and made conditional upon positive measures for freeing the international price system of its many restraints and thus leading to better international resource allocation. Under the European Recovery Program it is in precisely this way that much of the progress in reducing European trade barriers has been made.

Clearing a road such as suggested is fraught with danger. Yet if, in spite of our efforts to turn into the high road proposed by Professor Jesness, we do continue in the zone of expediency we need to at least explore the criteria by which a better course can be charted. The existence of surplus supplies and the embarrassment of a government agency is certainly not an adequate basis for determining what to sell. But unless other criteria are developed, these are the ones which will be used. There are difficulties involved in determining what would be socially and internationally accepted as an improved distribution of income (it is not necessary to determine the ideal distribution). Areas where population is at or close to the Malthusian level would need to be handled separately. However, if by using direct payments of some type it would be possible to decrease the desire of most nations to warp international trade to their own advantage, positive gains would occur in total production as world resources were used more efficiently. These will repay part or perhaps all of the subsidy. The expansion in production plus the income supplements could become a powerful impetus leading toward a better world order, leading us by a circuitous route to the plateau of multilateral trade.

In bringing these ideas together, the following items seem worthy of consideration and further discussion.

(1) It is imperative that the cyclical problem be settled before any real progress can be made toward efficient international trading. Otherwise the first sign of a depression will be the signal for the intensification of quota and exchange controls either within or outside the ITO.

(2) Specific attention should be given to the problem of desirable world income goals on a multilateral basis. All existing inter-

national programs and possibly new ones would need to be revamped into an integrated program leading towards definite long time goals and not a series of separate and conflicting ends.

(3) Domestic agricultural programs in the United States should not operate to tip the terms of trade to our advantage. This, of course, assumes that the United States is at the top of the heap as far as income is concerned, and can afford to give up any measures which further increase its differential advantage.

(4) International programs should have a minimum effect in directly influencing resource allocation, but should be made conditional upon moving towards the elimination of existing wholesale interferences with international trade and the international pricing system. A difficult problem in such a program is maintaining international self-respect and continued efforts on the part of individual nations toward solving their own problems. Great Britain is a case in point.

I concur fully in the desirability of the goals and conditions of trade which Professor Jesness discussed as long time resource goals. We have made tremendous progress in the United States in our attitude towards international trade, yet in the world as a whole there is ample evidence of a less than wholehearted acceptance of the ideas of trade. The International Trade Organization has not been fully accepted. Considerable unrest is being generated as one industry after another here and abroad begins to feel the impact of the tariff cuts negotiated at Geneva. It is time to try some different techniques to lift ourselves from the morass of restrictionism into which the world has sunk. The road I suggest exploring leads dangerously close to the swamps of wholesale state interference in trading. If we lose our footing we may be worse off, but if successful, we will find that we have made real progress towards reestablishing a world trading system on a basis which has a larger measure of permanence. If we are to progress towards free trade, it is essential that we attack the problem of income changes over time and the problem of income differences between nations. Lacking this, the next economic crisis is likely to add further to the array of devices used in restricting trade.

FOREIGN TRADE PROBLEMS—FURTHER COMMENT

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CAN the United States fulfill its avowed determination to establish world conditions conducive to a high level of multilateral trade? The Aegean stable of world trade is still heavily laden with exchange controls, import quotas, export subsidies, bilateral agreements, unbalanced trade, and restrictive internal economic policies. Notwithstanding our notable postwar extensions of foreign aid, the creation of the International Trade Organization and the world bank and monetary fund, the task which we have assumed remains truly Herculean.

In assaying this task and considering the signposts ahead, it appears essential to review a few postwar trends and current factors in the foreign trade picture. The United States has invested heavily in postwar world reconstruction and recovery. Government grants and credit extensions between July 1, 1945 and the end of 1948, totaled more than \$20 billion, approximately half the total being in each category.¹ Leading recipients of this aid included the United Kingdom (\$5.4 billion), France (\$2.8 billion), Germany (\$1.8 billion), Italy (\$1.4 billion), China (\$1.6 billion), and Japan (\$1.2 billion). The goods and services represented by these grants and credits contributed notably to the rapid recovery of production in many countries. However, they were insufficient, when combined with the exports of the recipient countries, to balance the cost of heavy import requirements of these areas. Consequently, foreign gold reserves and short-term dollar balances, other than those of the U.S.S.R., decreased an estimated four and one-third billion dollars during the two years 1947 and 1949 and now are down to an estimated total \$14 billion.² By the close of 1948, several countries, fearful that heavy gold and dollar drains would shortly jeopardize their limited internal financial stability, tightened import restrictions. This action was largely responsible for the reduction of United States exports of goods and services from almost \$20 billion in 1947 to \$15 billion in 1948. United States imports of goods and services, on the other hand continued to rise in 1948 and the net United States balance on goods and services

¹ This aid included \$10,471,000,000 in grants and \$9,668,000,000 in the form of loans and credits. Source: Clearing Office for Foreign Transactions, U. S. Department of Commerce.

² *Federal Reserve Bulletin*, May 1949, p. 485.

account dropped from the \$11.3 billion high point in 1947 to \$6.3 billion in 1948. United States credit advances and donations, governmental and private, accounted for all but \$100 million of the foreign trade balance deficit in 1948. This trend of events has continued on into 1949, as many of our leading customers seek non-dollar requiring sources of supply or bilateral balancing agreements. About one-third of our reduced exports are made possible by credit and donations to our customers.

Several writers at home and abroad have expressed some satisfaction with the strident effort of foreign areas to balance their dollar accounts.³ At best, this is a short-run adjustment to meet the current crisis and in no sense solves the longer-run problem of increasing the volume of world trade and creating conditions approximating international equilibrium.

Looking ahead several important and closely related questions must be raised. Is the world dollar shortage to continue as a chronic brake on world trade? Are United States imports about to level off or will they continue to expand and thus contribute to the solution of the problem of international trade stability? Will United States credit policies meet the needs of the world in the decades ahead or will we increasingly restrict our assistance to military aid and economic advice? Can internationally administered exchange rates be effectively managed so as to stimulate world trade? Can internal economic policies, at home and abroad, accomplish high level employment and production and also be consistent with an expansionist foreign trade policy?

There exists a remarkably close historical relationship between imports and industrial production in the United States.⁴ Although on the increase, our imports of goods and services are probably \$2 billion below the level which could be expected, given a continuation of the United States import-national income ratio of the past, and United States industrial production and national income at their recent level. Limited foreign production of goods and services complementary to the United States economy during the first postwar years, and United States import restrictions have largely shared the honors in holding down United States imports. Assuming that our present economic adjustment does not carry

³ Dembity, L. N., and Hirschman, A. E., "Movement Toward Balance in International Transactions of the United States," *Federal Reserve Bulletin*, May 1949, pp. 480-483.

⁴ *The United States in the World Economy, 1943*, United States Department of Commerce, p. 39.

our real income much below the present level and that it will subsequently rise, and assuming further that we will continue to relax import barriers, especially quota restrictions, the prospect for expanded imports appears reasonably good. To the extent that such a development takes place, the need for future donations to foreign areas will be reduced.

If properly timed and skillfully adjusted, changes in exchange rates may well encourage trade expansion and foster conditions of international equilibrium. The charter of the International Fund makes quite clear the intentions of the member countries to collectively employ exchange rate adjustments in support of foreign trade equilibrium without impairing the level of economic activity in the separate economies. The fact remains, however, that appropriate and mutually acceptable exchange rate adjustments remain a highly complicated task. The United Kingdom resisted devaluation of the pound in the postwar years in spite of pressure to effect the adjustment. While world markets were strong and readily accepted the total of Britain's exportable surplus, she had nothing to gain from deliberately worsening her terms of trade. With expanding output and softening world markets the British Government and officials of the monetary fund must still carefully evaluate the nature and degree of disequilibrium, the elasticity of demand for United Kingdom exports, the elasticity of imports, and the cross effects of prompt devaluation of many other currencies which followed the downward adjustment of the pound. It is more than likely that the demand for United Kingdom exports and the United Kingdom demand for imports are relatively inelastic, at least in the short run. Assuming that a moderate or substantial devaluation of the pound might give some aid to the hard pressed British economy, it would not likely solve her major problems, including high cost of power and raw materials and production inefficiencies.

The time is here when members and staff of the International Fund must demonstrate the ability of that organization to contribute to monetary conditions favorable to full and stable international trade. It must be realized, however, that the Fund is not equipped to solve all or even the major problems barring the path to international equilibrium. The first prerequisite to high level and balanced trade is a high and sustained level of economic activity in the principal trading nations of the world. An important element in achieving expanded production at home and abroad during the

next decade or two will be the foreign lending policy of the United States. The fact that United States loans and credits abroad during the last four years totaled no more than \$10.5 billion must be attributed in part to the fact that our donations were roughly equivalent to that figure. Sharply expanded United States foreign loans during the next decade or two would offer at least the following gains:

1. Remove foreign reliance on United States Government donations by 1952.
2. Alleviate the current and prospective balance of payment crises more or less chronic in a number of important trading countries, and reduce the time until the dollars, pounds, francs, lira, and other currencies of the world can be freely converted. This development would free Canada and many other countries from an extremely serious balance of payments problem which in turn jeopardizes their internal economic stability.
3. Give necessary support to the United States policy of exporting technical know-how. The fourth point in President Truman's inaugural address, the so-called Bold New Program, if thus carried out in truly bold fashion would enable many underdeveloped countries to sharply expand their efficiency and level of output. This in turn would go far toward assuring an unprecedented level of international trade.
4. Create a sustained and high demand for United States industrial and agricultural products which are geared in production for a world market.
5. Stop the strong present trend toward bilateral trade agreements. An adequate supply of dollar exchange would no doubt go far toward removing the incentive for bilateral trade and exchange clearance. Such loans may well come from both governmental and private sources to the extent of \$5 billion to \$10 billion a year. A broadening of the Charter of the International Bank for Reconstruction to enable that institution to manage such increased credit activity may be the most desirable step.

At this point I would like to pay brief respects to United States farm policy and its relation to our expansionist foreign trade policy. Support price and export subsidies are in obvious conflict with our goal of increasingly unrestricted multilateral trade. A shift of United States farm programs away from support prices to farm income support would resolve in large measure this fundamental inconsistency. If, however, the political roots of farm prices sup-

ports are deep, an early and full solution of this problem does not appear in the offing. The implications of price supports as they impinge on foreign trade policy is strikingly exemplified in a recent potato incident. The United States granted Canada a three and one-half million bushel potato quota as a part of our reciprocal trade understanding. As these potatoes came into the United States and benefited pricewise from our support price program, American potato interests lodged strong objections. The political pressure became sufficiently strong to induce the United States government to ask the Canadian Government to release us from our quota commitment. Such procedure must shake the faith of other countries in our ability to carry through on our trade commitments. Export subsidies likewise invite retaliation and bode no good for liberal trade objectives. However, to the extent that international commodity agreements cover basic commodities, to which United States subsidies are commonly applied, the major foreign objection to subsidies may be removed. In fact export subsidies become an essential feature of the program when, as in the case of wheat this year, the United States support price is above the maximum price provided for in the international agreement. Whether or not the wheat and other agreements will serve to expand trade and effect a distribution of the world's production along comparative cost lines remains to be seen. In the event of sharply declining prices and apparent excess world stocks of agreement commodities, there will come a severe test of this technique for avoiding the collapse of prices and, even more important, avoiding the uneconomic policies which were commonly applied to basic commodities in many countries during the 1930's. In light of the basic commodity market experience of recent decades and the uncertain status of international trade at this time, international commodity agreements could well be more hope than menace for future trade and economic peace.

Economic policies designed to encourage a high level of balanced foreign trade can contribute greatly to the material well being of this and other countries as well as economic and political peace in the world. Have we in the United States the collective wisdom and courage to continue and augment the world leadership which we have assumed in the realm of international economic policy in recent years? It appears not altogether unreasonable to assume that we do and in this, there is hope for the future.

IMPLICATIONS OF PARTICULAR ECONOMICS IN AGRICULTURAL ECONOMICS METHODOLOGY*

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THREE are two kinds of specialists in any field of science. One is the "tool-maker," who develops fundamental principles. The other is the "tool-user," who applies fundamental laws to specific problems. In economics the theorist is the "tool-maker" while the agricultural economist is a "tool-user." Obviously, it is also desirable that "hybrids" exist or that the "tool-user" stop to fashion tools which are needed but are not available.

Agricultural economics is simply economics applied to agriculture. It draws upon economic theory for its basic laws and analytical models. Few if any laws have emerged from empirical research in agricultural economics which were not already explained by or implied in the logic of economic theory. Economic theory, like all the theoretical sciences, is a deductive science. The deductive theorems of pure economics are the hypotheses or models to be subjected to empirical test in the various phases of applied economics.

It should be emphasized, however, that the important relationship of theory to applied economics is not one of simply developing new theorems to be proven or refuted by empirical analysis. While useful and necessary, this step can be one of idle curiosity. Theory should not be looked upon as an end or an art in itself. Conversely, the function of applied research is not solely one of searching out new models and theories in pure economics to be duplicated in or refuted by empirical observation. The important relationship is instead one of selecting an important problem in life and then drawing upon the appropriate model which provides the logic underlying the theoretical solution and suggests the pattern of empirical observation.

The important contribution of theory to empirical study can best be visualized by outlining the five fundamental steps in empirical research and the part that analytical models play in each.

I. Formulating a problem. A problem can be defined in either of two related but yet distinct manners. (a) *In terms of the doubt,*

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confusion, or uncertainty that faces individuals or society. Here a problematic situation is ordinarily identified through the expression of felt difficulties by individuals or groups. Problems delineated in this fashion are of the practical sort (although no more important than those outlined under b) and ordinarily call for immediate solution.¹ (b) *In terms of departure from ideal or optimum conditions.* This method of problem formulation might be termed the "normative" approach. The equilibrium conditions of economics serve directly in identifying and outlining problems. Equilibrium explains the conditions under which a given end is maximized or fully attained.² Deviation from this ideal or optimum (relative to a given end) is indicative of a "problem." The solution lies in determining the reason for deviation of the *existing state* from the *theoretical (or empirical) optimum* and explaining the means of moving from the former to the latter.³

Obviously, there is a great deal in common between the *confusion* (a) and *equilibrium* (b) methods of problem formulation. Individuals or groups express doubt or uncertainty about the *existing order* because it departs from a state which they believe is the ideal. In this vein the two methods are identical. Certainly, a great many significant problems are "uncovered" in this fashion. However, under the *confusion* method the problem is present before it is recognized. Identification of problems by means of ideals or optimums more nearly allows their anticipation and solution before the crystallization of a "problematical" situation by the public.

II. *Formulating hypotheses.* Given a problem, the most important

¹ The two concepts of a problematic situation are more nearly identical if the "confusion," "doubt," or "felt difficulty" is in the mind of the research worker rather than conveyed to him by other individuals. Emphasis is on the fact that economic theories or models delineate problems in and of themselves. The body of theory acts both as a stock of (a) calipers for indicating problems and (b) hypotheses for their solution. The important reason that these "convenient tools" relating to real life problems are available is simply because in the past they have been developed to solve real economic problems which faced (and continue to face) individuals and society. In physical sciences some of the more important discoveries grow out of abstract notions of an optimum which is not attained (in contrast to a direct expression of a problem by individuals other than the scientist.)

² The relativity of means and ends should be recognized at this point. Ends in economics are often not ultimate ends but only intermediate ends—ends to be attained only as means to more nearly ultimate ends. In this vein, the ends which we mention here need not be ultimate ends. Too, our use of the term "normative" refers to the ideal expressed by maximization of this end (whether it be intermediate or ultimate). It does not refer to "what ought to be" in an ethical sense.

³ Research is of ultimate social value only as it provides answers for this step. This is the "policy" recommendation. It is equally important for individual firms, individual consumers, and society.

step in research is formulation of hypotheses or theoretical solutions. Herein lies the design of the entire empirical procedure. Again, it is the general or basic laws of any science which function as models and hence provide hypotheses which guide the various empirical phases of investigation. The use and adaptation of theoretical models is one of the most neglected steps in empirical research. Without a theoretical solution the probability is small that one will be found in reality. In a practical vein an analytical model can be looked upon as a mental picture of the relationships (qualitative and quantitative) involved. The model also suggests conditions which must hold for maximization of a given end and thus indicates the kind and quantity of data necessary for its solution. Models are employed in all sciences and may be of either a physical or a mathematical or abstract type.

III. *Designing empirical procedures.* This step includes specification of (1) the evidence needed, (2) the statistical techniques to be employed, (3) the design of the sample or experimental method, and (4) tests of significance (or bases under which the hypotheses will be accepted or rejected). These aspects of empirical procedure should be decided upon before data are collected (in contrast to a common sequence whereby data are assembled and then questions of the appropriate statistical technique are examined). Yet these are given automatically once the analytical model is specified in step II. The appropriate statistical technique is given once the applicable model (hypothesis, theory) is formulated. In turn, the appropriate (a) sample or experimental design and (b) test of significance is given once the appropriate statistical technique is determined.⁴

IV. *Assembling and processing data.* This step is largely routine. It involves implementing the thinking which has taken place in steps I, II, and III through selecting the sample, devising a ques-

⁴ If the model involves functional relationships, as in economics, it specifies (1) use of regression analyses as the appropriate statistical techniques, which in turn specifies (2) a sample stratified by the independent variable and (3) tests of significance of (or between) regression coefficients. If the model involves discrete populations and attributes it implies (1) use of means and frequency distributions as appropriate statistical techniques and hence (2) a random sample and (3) analysis of variance or chi square as tests of significance. A model indicating a closed system and a simple relationship between a dependent and independent variable would specify a single-equation, least-square regression analysis. A model indicating a system of interacting economic forces and jointly dependent variables would specify application of simultaneous equations.

tionnaire, enumerating data, etc. Too much research is initiated with step IV (data collection is substituted for thinking).

V. *Interpreting findings.* Interpretation of findings requires both statistical (mathematical) and economic analysis.

The important role of analytical models in applied research is now apparent. They provide imagination at every turn and function to systematize problems, express hypotheses, and outline empirical procedures. These elements of investigation are not distinct but flow simultaneously from single models. Greater recognition of (1) the fact that economics is the basic science underlying agricultural economics, and (2) the role of the appropriate analytical tools in empirical procedure would do much to systematize empirical research methods and findings. There is evidence that economic studies are made in agriculture without recognition of the relevant economic relationships.

Scientific Objectivity

The role of theory can hardly be restricted to use as a guide in empirical research. There are numerous economic problems where little foundation exists for empirical analysis. In some instances appropriate models have not been developed. In others, the complexity of the models is too great for currently available statistical techniques. The impossibility of quantitative observation or control of phenomena also is one of the more important conditions which excludes their application to empirical material. Then, too, there are areas in which the logic of economic postulates is obviously valid and needs no empirical verification even though it be possible.

Finally, perhaps the most important problems in life must be "solved" without empirical data. We cannot wait to "let the facts speak for themselves" simply because all the facts will never be available. Quantitative data are not available for telling farmers how to combine each infinite unit of resources. Nor are they available for fashioning a "perfect" national policy. Economic logic rather than empirical analysis must provide the guide in the *greatest number* of individual and national economic problems. Economic principle provides the vehicle whereby scientific objectivity can be attained even though the analysis must be in terms of systematic logic.

To be certain, empirical research is not always free from bias, personal evaluations and distorted inference. "Facts" are frequently

more open to bias than mental deduction. However, disagreement between "facts" can always be resolved by further observation and refined statistical treatment. Resolving conflicts is not so simple where analysis is possible largely or only in the form of scientific deduction. Yet scientific objectivity is possible even here; findings can have interpersonal validity in the sense that (1) two or more individuals analyzing a given problem can arrive at mutually consistent solutions, and (2) the *analysis* of any one individual is apart from his own personal beliefs, judgments, and values. The role of economic principle in guaranteeing scientific objectivity can best be visualized by reviewing the major conditions which give rise to conflicting solutions: (1) *The investigator does not employ systematic logic or deduction in his analysis but instead generalizes from isolated personal experience and judgment.* The difficulty here is not that the individual attempts to incorporate his own system of values into the analysis but that he fails to employ scientific thinking or the rules of logic. Personal experiences are valuable in formulating hypotheses. However, "hunches," "beliefs," or "judgments" based on a "restricted sample" seldom provide the basis for broad generalizations. The underlying assumption here is always that the "conditions" surrounding the "experience" are identical with the "postulates" of the problem in hand. (2) *Problems are defined in respect to different (levels of) ends.* Disagreement in solution may arise because investigators do not define their problem relative to a given end in the means-end scale. For example, in the economics of the individual, one research worker relating his problem to the end of *profit maximization* (an intermediate end) may rightly suggest that the farmer work more hours, use his labor "more efficiently," and hence increase income. A second investigator, relating his problem to *utility maximization* (a more nearly ultimate end), might correctly recommend that the farmer do less work and utilize labor "less efficiently" if the utility sacrificed through a decrement in money income is less than the increment in utility gained from working fewer hours. Disagreement in findings arises here not because the investigators (a) fail to employ scientific logic or (b) introduce personal value or bias, but rather because the problem is defined relative to different ends. (3) *Analysis is in terms of the individual's valuations or vested interests.* Research workers, like other individuals, are members of specific social and economic groups; they are Democrats or Republicans, farm owners

or salaried workers, investors in sheep ranching or stockholders in synthetic textiles. Further, vested interests also grow up and are perpetuated in universities and other educational or scientific organizations. These various conditions expose investigators to influences other than pure scientific objectivity. Economic policy analyzed and evaluated by individuals in terms of their own interests and norms necessarily leads to varied conclusions. Lack of agreement here grows largely out of conflict in ends at the same level in the means-end hierarchy.

Economic theory provides a common logic whereby scientific objectivity and interpersonal validity of conclusions can be guaranteed even in the absence of empirical analysis. The laws or theorems of economics are deductive set of propositions derived by the rules of logic from basic propositions called assumptions or postulates. It is these laws which fashion patterns of uniformity into a coherent system. However, since alternative hypotheses or theorems are possible, depending on the underlying postulates and the end which serves as a frame of reference, mere application of economic theory is not a sufficient condition for attainment of mutually consistent solutions. It is also necessary that (1) the problem be defined relative to a given end and (2) the underlying assumption and postulates be stated and reconciled.⁵ Accepted economic principle provides this framework for interpersonal validity of findings.

Branches of Economics

Two main branches of modern economics are "microeconomics" and "macroeconomics." Microeconomics deals with particular firms, particular households, particular industries; the price, demand, or supply of specific commodities; the productivity of or returns to specific resources and other individual relationships and quantities. It includes an important portion of marginal analysis and also considers interrelationships of particular units in describing the economic system and outlining optimum economic organizations. Macroeconomics is a study of composite economic quantities.

⁵ The "end" need not be consistent with all investigators' personal values or beliefs. It is also irrelevant whether the "end" is an "intermediate end" (means) or a more nearly "ultimate end." It is only necessary that the problem be defined relative to a *given end*. Science is concerned only with this definition of a problem (irrespective of whether the problem is important as measured by other criteria). Science is unconcerned with the end *per se* but rather, given the end, is concerned with deductions relative to the end.

It is concerned not with individual prices, commodities, industries, or households, but with such aggregates as the general level of prices, the level of employment, or the national income. Macroeconomics is especially important for certain crucial economic and policy problems given, not in individual, but in mass phenomena. It is also claimed that in aggregation the maze of individual facts and relationships can be reduced to a few variables and relationships with a greater adaptation to statistical treatment. Conversely, there is much to be claimed for the application of microeconomics. Often the particular relationships between phenomena have greater significance than the composite aggregates of which they are part.

Microeconomics has a wide range of application, especially in agricultural economics, where it is often the particular relationship, quantity, or organization which is the focus of investigation. A greater quantity of research in agricultural economics has been based upon micro than on aggregative models. However, the demarcation between particular and aggregative relationships is not as distinct as supposed when certain conventional empirical procedures are employed. *First*, while the objective often is to predict intra-unit relationships, these relationships are based on inter-unit observations. In a farm management study the analysis may be one of the relation of returns to scale. However, the empirical data is obtained not by varying the scale of one firm and observing returns within it but by observing returns for firms of different scale. Similarly, in estimating a demand curve, observations are obtained not by varying prices in a *given market* (wherein national income and other aggregative economic quantities are constant) and observation of the quantity purchased under each but by obtaining observations from *many markets* over time. The relationships derived from inter-unit data are often of an aggregative character and may not be duplicated within a unit. Given cross-sectional observations, joint relationships between variables and the aggregative character of the quantities, alternative theoretical models and empirical techniques often should be employed. One alternative is to substitute more complex models and simultaneous equations for simple models and less efficient least square regression or simpler techniques. *Second*, inferences based on particular analysis may often prove erroneous if macro relationships are disregarded. Inference from a sample may be that one farm can increase re-

turns by shifting resources from hay to grain. Yet, should all farmers shift, an opposite outcome is possible. This complex is also important in outlook work where recommendations framed in micro perspective may have an opposite aggregative outcome.

Systematic Specialization

Historically, a large number of specializations have emerged in agricultural economics. These include credit, appraisal, farm management, production economics, tenure, land economics, cooperation, prices, policy, egg marketing, milk marketing and others. These specializations grew up largely around individuals who initiated specific studies. They do not parallel systematic economic problems and analytical tools. Development of these specific strata took place before the full role of economic analysis was recognized. Specializations have been perpetuated over time through graduate training and reverence for fields *per se*. Since historical specializations make little sense in terms of systematic economic problems and analytical tools it is impossible to designate "specific theories" which fit "specific fields." Agricultural economics research will be more productive in the long run if specialization is in terms of systematic economic problems and models. For example, it is impossible to study the economics of land, capital or labor use alone and distinct from the other factors. These can be studies in proper perspective only as part of the more general production economics (resource efficiency, farm management).

Alternative specializations might be possible in terms of systematic economic analysis. The major problems of an economy are, of course, efficiency in production (including progress), equity in income distribution, and stability of the system. More specifically the basic relationships (both micro and macro) are (1) production relationships, (2) consumption relationships, and (3) market or exchange relationships for (a) resources and (b) commodities. In terms of economic analysis (systematic problems and analytical tools) the following appear to be relevant areas of specialization in agricultural economics. Reference is to particular equilibrium and basic analytical tools: (1) *Production economics as a study of resource combination and allocation*, (2) *Consumption economics as a study of household welfare and income allocation*, (3) *Market economics as a study of price, supply, demand, and other market*

relationships, (4) Resource prices as a step in analysis of functional and personal income distribution.

Perhaps additional specializations are needed. Even the fields delineated above on the basis of major economic relationships are too specialized for many problems. One area of importance is that of instability and the forces underlying economic fluctuations. The models appropriate for analysis of major phenomena (national income and employment) lie in the field of aggregative economics. However, certain micro tools are also applicable and fundamental in the study or prediction of the behavior of particular units. These might better be handled in specializations which treat the static phases of production, consumption, and market relationships in order that realism be retained.

Policy is another area which must be mentioned. However, there are no unique relationships or analytical tools (the criteria here for delineating specialization) underlying policy. It simply relates the specific quantities of several particular relationships. All economists should be concerned with "policy." There can be "policy" in terms of individual as well as of national scale. The same mathematical criteria and necessary conditions for *maximization* exist in case of any unit. The point is this: there is nothing unique about economic analysis at any level or scale. Agricultural *economists* should be *economic analysts* rather than extreme specialists who do not follow out a problem to its roots.

Economics of Primary Production

The most highly developed set of analytical tools in economics is that of microeconomics. Yet a great void exists in their use, even in areas where they are clearly applicable. Two centuries of economists have developed a highly refined and in some respects a time-established theory of production, economics of the firm and marginal productivity analysis. Farm management, an historic and applied counterpart, is variously defined as a study of intra-firm, inter-firm, and inter-regional resource efficiency. Perhaps no other specialization in agricultural economics is so richly tooled in principles and theory. Even then, some workers fail to recognize simple, time-established, and extremely obvious models and relationships. Note the empirical findings from many surveys and record analyses showing that "the higher the crop yield per acre the greater the

profits." These imply constant or increasing returns. Even farmers recognize this fallacy. Otherwise, the entire product for one farm or the nation would be grown on a single acre.

The theory of the firm and marginal productivity analysis define optimums for the combination of resources for a given output, the allocation of given resources between alternative products, the level of intensity for specialized resources, the relationship of returns to scale, the location of production, the timing of production in terms of seasonality and conservation, the form of resource acquisition, and other questions of resource allocation and productivity both within firms (farms), between particular farms, between particular regions, and so forth. They provide the skeleton upon which empirical analysis should be built in terms of sample design, statistical technique, and forms and sources of information.

An important portion of farm management research is in terms of static analysis. Its findings are for given prices and transformation coefficients since studies are made for one year of established price and yields (or a period of years with a given mean of these) with implication that these will continue into the future with certainty. These analyses are unrealistic. The dynamic theory of production, the analytical counterpart of farm management is often of infinitely greater value in explaining or providing the rationale of economic behavior than current static empirical analyses. Study of risk and uncertainty and the dynamics of the firm is one of the most neglected areas in farm management. Straight testing of the hypotheses which now exist in pure theory stands to be of value in itself. Studies should provide basic information not only for guidance of individuals but also as a foundation upon which policy (storage, credit, price) designed for greater stability might be based. Research should indicate the manner and degree to which resources are adapted in terms of cost structure and flexibility and adaptability; selection of enterprise, scale of operations, and capital rationing. Another neglected area of analysis is that of returns to scale in agriculture. Although the greatest proportion of farm management studies over the past three decades have examined the efficiency of farm size, there are no systematic studies which indicate the nature of economics to scale. Investigations built around existing theoretical models would be of value in removing the multitude of public myths, beliefs, and conflicts which now revolve around farm size. Studies are also needed of the interrelationship of the firm and the household in agriculture.

However, the tools of static analysis are by no means obsolete and useless. On the one hand the production economist should take the initiative and cooperate with the technical scientist in establishing the physical transformation coefficients, marginal rates of substitution and production functions such that cost and prices can be applied to suggest the most efficient combination of resources. On the other hand application should be made of the static models of marginal analysis in estimating the (value) productivity of land, labor and capital resources in particular firms, in particular farming regions, for particular products, etc. Productivity analysis of this sort should indicate the degree to which disequilibrium exists in the allocation of farm resources and hence serve as a guide to (1) individuals in adapting their resources within the business, between farming regions and between industries and (2) government policy designed to promote resource efficiency.

It is at this very point that an important distinction should be made between the findings of micro and macro analysis. Aggregative analysis of the last several years suggests that the value productivity of capital is relatively high as compared to labor under the existing structure of agriculture. Hence the interpretation that a greater total quantity of the former and a smaller quantity of the latter should be employed. Yet it is in instances such as this that aggregative analysis may break down. It does not recognize particular relationships which are all-important. A distinct and likely possibility is that should less labor be employed in agriculture, less total capital would be "required." The value productivity of a given total quantity of capital might also be less. The hypothesis is this: A smaller number of people and farms in agriculture would necessitate fewer buildings, fences, tractors and machines. The decreased investment in these specific forms of capital could, of course be invested in other specific forms, such as fertilizer, improved seed, etc. Because of the inelasticity of demand for most farm commodities, however, the value productivity of an equal total capital might well be less in the second than under the original organization of agriculture. Only particular analysis can segregate these potentialities.

Market Relationships

Specialists in price analysis have been generally aware of tools which underly their investigations. They have been concerned in estimating demand curves, supply curves, and price elasticity of

demand for specific commodities. Perhaps not enough attention has been focused on income elasticity of demand. Analysis of specific market relationships will continue to play an important role. Knowledge of composite demand curves, supply curves, and price and income elasticities for agricultural products is basic to policy. However, knowledge of these quantities for specific commodities is equally important. The composite analysis tells nothing about the outcome for individual commodities under a given price policy. If the elasticity of aggregate demand is less than unity, for example, the elasticity for a particular commodity may still be greater than one or even less than for all commodities (as an average). Obviously, particular analysis is important both as a basis in advising individuals (outlook work) and in predicting income and other consequences of price storage and similar programs.

However, particular relationships perhaps can be isolated only if the investigator is aware of the important aggregative relationships. It is now widely recognized that many of the empirical demand curves derived by least squares regression for individual commodities in the past have been only hybrid expressions of different demand and supply curves for the particular commodity and certain composite variables of the economy. Current econometric procedures suggest means whereby the aggregative forces can be treated in a system of simultaneous equations which allows isolation and more efficient estimation of a particular market's relationships and quantities.

Secondary Production or Agricultural Processing

A large portion of the analysis labeled "marketing" is not "marketing" at all in terms of basic economic relationships (supply, demand, price, elasticity). In terms of analytical models the nearest kin of the study which relates costs and volume in creamery operation, resource productivity in the packing plant or the location of soybean processing is farm management or production economics research. All are studies in the economics of the firm or the theory of production. The only distinction is this: One deals with primary while the other deals with secondary production.

A large number of important studies are possible within the area of secondary production and the applicable analytical framework. These parallel the relationships of production studied in farm management and need not be repeated in detail here. Market

relationships need have little bearing on such studies. However, there is an important area in secondary production where the analytical framework is both one of production and one of market relationships. This situation holds true for monopoly, oligopoly, or other forms of imperfect competition. Here demand or supply curves are not only relationships of a particular market but are also those of a particular firm. Although Nicholls pioneered important and original work in this field, the field has not yet been fully exploited.⁶ Extended research is still needed in specific products and for specific firms. Microanalysis in the several areas of specialization should eventually aim at a general equilibrium analysis.

Income Distribution and Consumer Economics

Recent and current agricultural policies have been built largely upon distorted inferences surrounding aggregative quantities. The basic claim upon which agriculture has sought and obtained income transfers (under the guise of various storage, price, conservation, and other policies) has been the "aggregative" comparison of income per farm person with income per non-farm person. These broad averages are meaningless. There are many people on farms with incomes greater than those in other industries. The income of the wealthy farmer is supported, bolstered, and increased in magnitudes entirely out of line with welfare criteria and the public subsidy to the low income farmer or non-farm family. This comes about evidently because the public looks at composite farm and non-farm income ratios and therefore concludes that all farm people are "poor" and all non-farm people are "rich." For this and other reasons, research in income distribution and the pricing of factors is important. Here the crucial analysis should be in terms of particular individuals and groups and of the interrelationships of resource productivity, resource price and resource ownership. Analytical guides are not so clear cut here as in other important problem areas. However, the concepts of markets for factors and the marginal productivity of resources are steps toward formulating systematic analyses of personal income distribution.

A marriage which stands to be productive is that of studies in personal income distribution and consumer economics. The import

⁶ Nicholls, W. N., *Imperfect Competition in Agricultural Processing Industries*, Iowa State College Press.

of this joint relationship ranges from obvious individual problems to far-reaching public policies. The welfare justification of a price policy in agriculture depends partly, for example, on fashioning means whereby the consumption and diet of low income persons can be improved. Similarly, a storage program alone which stabilized production or the flow of product to the market may or may not increase total welfare, depending on how it affects individuals. One possibility is that the increment to total utility is greater under fluctuating supplies whereby low income groups can occasionally buy a quantity of the product than under schemes which stabilize prices and supplies out of reach of their incomes.

Welfare

All economic reorganization aimed at maximum social welfare must be couched ultimately in terms of particular economic units. The reasoning is obvious. Reorganizations are either one of two sorts: (1) those which make some individuals or groups better off only at a sacrifice of utility by other individuals, and (2) those that make some individuals better off without impairing the utility of others. An increase in total welfare is always guaranteed under the second. This is not true, however, in the first. The increment in utility to benefiting individuals may be greater than the decrement in utility to sacrificing persons. Policy could be based entirely on aggregative quantities only were it true that all individuals gain and none sacrifice as a result of public actions. This notion is entirely apart from reality; most economic reorganizations result in transfers between individuals. Occasionally, it is clear that transfers augment total welfare, but in most cases this is not true. Since inter-personal utility comparisons are impossible, an increase in total welfare can then be guaranteed only if compensation can be directed between the two groups so that the portion of those with impaired incomes is no "worse off" than previously. Accordingly, policy can guarantee greater welfare only as it recognizes particular relationships and so gauges its course of action. Microeconomics will thus continue to be important and perhaps a crucial area of specialization and concentration.

IMPLICATIONS OF AGGREGATIVE THEORIES FOR AGRICULTURAL ECONOMISTS

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WAVES of fashion are not uncommon in economics. Each generation of economists seems to have its own "Holy Grail." The graduate student of today is exposed to and becomes saturated with concepts and relations unknown to his teachers in their days of graduate study. Nevertheless, there does exist a continuity in the development of economic thought. The historian of economic ideas can usually point to some earlier writer who at least had the "germ" of the so-called new approach. Today, a forefront of economics is immersed in that area which some call aggregative theories and others refer to as macroeconomics.

I

An early point to clarify concerns the essential differences between aggregative and particular equilibrium theories. A main difference is that particular equilibrium theories are concerned with the economic characteristics of individual consuming units, individual producing units or a particular industry. In contrast, aggregative theories deal with the economic system as a whole. Their object of analysis is the functioning of the economic system in totality, and the variables are values or functions of national totals or national averages.

Aggregative theories are a means of approaching, in a simplified but manageable way, some of the goals of the Walrasian general equilibrium. That system, as is well known, incorporates individual households and firms, as well as interrelations within the entire economy. Each separate economic unit is explicitly reflected, and each product has its own supply and demand functions which include also the prices of all other products. Conceptually, such a general equilibrium structure, if specified in adequate detail, can provide a means of determining equilibrium prices and quantities for the system as a whole as well as for the separate economic units within the system. To construct such a system, however, requires an extremely large number of equations to be solved in order to determine an equally large number of unknown values. Why Walrasian general equilibrium analysis has not proven useful

for practical purposes can well be appreciated.¹ To have a method of analysis which is manageable and provides a basis for making usable economic decisions concerning the economy as a whole, it is necessary to deal with aggregates and use aggregative theories. Such methods of economic analysis are often referred to as macroeconomics, in contrast with microeconomics which pertains to the behavior of individual economic units and for which particular equilibrium analysis is widely used.

It is quite clear that the current emphasis on macroeconomics stems from the profound impact of Keynes' *General Theory*.² Many earlier writers did think, analyze and write in terms of aggregates, but the analysis by Keynes of national employment and its determinants set the stage for the current emphasis (more than a fashion, I believe) in analyzing problems of employment, income and wages. Aggregative theories, however, are not limited to Keynesian or neo-Keynesian economics. Anti-Keynesians or "neutrals" have and do operate in an aggregative framework.

The recent and current emphasis on macroeconomics is, in part, a return to the general analytical methods of the classical economists and even their predecessors. The Physiocrats, Mercantilists, Smith, Ricardo, Malthus and their contemporaries were primarily interested in and worked with national economic aggregates.³ In their frame of reference, the individual firm and the individual consumer did not receive the analytical attention afforded them by later writers. Only beginning with the neoclassicists did the analysis of the individual consumer receive priority, and it was even later that

¹ A simplification of the Walrasian general equilibrium system in terms of industry aggregates has been developed theoretically and statistically by Leontief. See: Wassily Leontief, *The Structure of American Economy, 1919-1929* (Cambridge 1941); the following papers in the *Quarterly Journal of Economics*, Vol. 58 (February 1944), Vol. 60 (February 1946), Vol. 61 (November 1946); and "Recent Developments in the Study of Interindustrial Relations," *American Economic Review, Papers and Proceedings*, Vol. 39, May 1949, pp. 211-225.

² John Maynard Keynes, *The General Theory of Employment, Interest and Money*, (Harcourt, Brace and Co., New York, 1936).

³ Joseph A. Schumpeter, in "Keynes, the Economist (2)" (*The New Economics*, edited by Seymour Harris, Knopf, New York, 1947, Chap. IX) writes: "Richard Cantillon was the first, I think, to indicate a full-fledged schema of aggregative, monetary, and income analysis, the one worked out by Francois Quesnay in his *Tableau Economique*. Quesnay, then, is the true predecessor of Keynes, . . ."

The progress of aggregative analysis, before Keynes' *General Theory* but in recent years, is indicated in J. Tinbergen, "Annual Survey: Suggestions on Quantitative Business Cycle Theory," *Econometrica*, Vol. 3, No. 3, July 1935, pp. 241-308. On this point, also see; H. S. Ellis, "The State of the New Economics," *American Economic Review*, Vol. 39, No. 2, March 1949, pp. 465-477.

the individual firm became the object of intensive analysis. But beginning with Marshall, partial equilibrium theory became so entrenched that the recent emphasis on macroeconomics seemed to some an innovation rather than a resumption of an established method of analysis.

II

Those who have specialized in farm management or production economics of the individual farm have most clearly confined their interests to what is now termed microeconomics. But even there, interest developed in questions of aggregative behavior. In fact, some of the early notable work by agricultural economists grew out of the recognition by some farm management students that full appreciation of the adjustments faced by the individual farm required more knowledge about industry or group adjustments, and of the behavior of the economic system at large.

The study of supply-response in agricultural production broke away from the confines of the individual farm and became concerned with group adjustments. Interest had shifted from the individual producer to an aggregate of producers of similar products. The preoccupation of agricultural economists with statistical demand curves, beginning in the early 1920's and not yet abated, also may be cited as an example of our concern with national or aggregative economic relations, although limited usually to specific commodities.

The situation and outlook program, which had already been highly developed before World War II, was pitched at the level of particular agricultural industries. Although the Marshallian partial equilibrium apparently was the theoretical structure underlying the studies for the various farm products, some aggregative features were recognized since the outlook was framed with reference to the particular industry at large. But here an element of macroeconomics also appeared. A major factor affecting outlook was the level of national income which influenced the outlook for all industries. But national income or the general price level pertained to the economy as a whole. Thus, the situation and outlook analyses incorporated some macroeconomic variables within a particular equilibrium framework.

The preceding examples have been briefly cited only to recognize that agricultural economists have been aware of and have used

aggregates. But they have been primarily aggregates for particular industries, and thus the economic analysis used retained largely the features of particular equilibrium. The situation and outlook program, for instance, treated macrovariables as exogenous. Questions of economic relations between agricultural industries or between agriculture and the nonagricultural segment of the economy, or between macroeconomic variables for the economy at large, were not dealt with explicitly.

In the middle and the late 1920's, agricultural economists began to pay considerable attention to national agricultural policy. However, the theoretical treatment of policy questions was based largely on a microeconomic analysis. For example, the economic analyses of "two-price" plans, such as McNary-Haugen and Export-Debenture, incorporated the theory of price discrimination. The theory of price discrimination, however, is not in the real sense an aggregative theory; it grew out of and is logically still limited to the pure-monopoly individual firm. Only by imposing extra-economic (e.g., legal or administrative) constraints upon individual firms to give the group a semblance of an economic entity can price-discrimination theory be used as a rational explanation of multiple-price plans applied to agricultural industries composed of a large number of separate firms. A similar conclusion may be reached with respect to marketing agreements, the economic rationale of which is basically price-discrimination theory.

The use of microeconomics in analysis of multiple-price plans and marketing agreements assumes that the commodity or industry under consideration can be isolated, in terms of impact and interaction, from other commodities, industries or the rest of the economy. The validity of such an assumption is questionable, especially for major commodities. Even if the assumption is not too unrealistic for individual minor commodities, such programs for a substantial number of minor crops, operating at the same time, may have an aggregative effect different from that expected on the basis of a single crop program. One may wonder whether the instability of multiple-price programs or the meager success in evaluating their effects stems at least partly from the fact that they are based on a theoretical framework of microeconomic analysis rather than some type of aggregative theory which reflects relations of the particular industry to other industries and the economic system as a whole.

The development of the AAA parity-price and parity-income

program brought with it an emphasis on national aggregates. The agricultural sector of the economy, aggregated by some means into a single economic entity, was contrasted with the nonagricultural sector, which was also aggregated by some heroic procedure. The interrelation and interaction between the two sectors or aggregates and the impact on the total economy was presumably explainable in terms of some aggregative theory which, although implied, was not clearly formulated.⁴ One may wonder what specific economic theories underlie parity-price or parity-income programs. But one cannot deny that some type of an aggregative theory is appropriate; a theory which would include aggregate variables for the agricultural and nonagricultural sectors, and whose purpose would be to bring out clearly the effects of parity programs on income and employment in the nation as a whole as well as in the agricultural and nonagricultural spheres. It should be noted, of course, that serious problems exist in connection with the process of aggregation.

It is widely accepted that for an industry which is purely competitive in the purchase of productive services and the sale of product, the industry's short-run supply function is equivalent to the simple horizontal summation of the short-run marginal cost functions of all of the firms comprising the industry. This is a simple example of the process of aggregation. But that is not an aggregative theory; rather, it is only an aggregative process which yields one type of function from other functions. In order to have theoretical relations between aggregate variables similar to the relations which exist between the microeconomic variables, the aggregates must be constructed in an appropriate manner. Simple totals, averages or usual types of index numbers need not yield aggregates whose interrelations can validly be used as in a microeconomic theory. For example, on a given farm using a specified production function, the equilibrium utilization of the productive services is based on the proposition that the marginal value product of each service equals the marginal cost of the service. To make an analogous statement for a group of farms, the aggregate variables reflecting the group must be constructed and measured appropriately.

⁴ See Mordecai Ezekial, and Louis H. Bean, "Economic Bases for the Agricultural Adjustment Act," U.S. Dept. of Agriculture (Washington, D.C., December 1933) for a widely distributed official statement; but in that publication the particular aggregative theory on which the argument is based is not sharply drawn.

Let us now return to the question of what bearing the aggregation process has on our use of economic theory. The conventional static marginal productivity theory of distribution may be considered as another example. Although such a theory may be questioned as to its realism in depicting individual firm behavior, its logical validity—as an internally consistent set of relations within the static framework—still stands. But what can we say about applying the marginal productivity theory to an industry or to the economy at large? Is the theory which is logically valid for the individual firm also valid for a sector of the economy without affecting some of the pertinent relations incorporated in the theory?

The outcome of several papers on this question indicates that the usual marginal productivity theory based on the individual firm cannot simply and at the same time validly be carried over in application to aggregates, and such procedure is even more invalid if the productive services are not homogeneous.⁵ Unless the analogies from microeconomics do occur among the aggregates, it would appear that basing our study of resource allocation in production or marketing, for agriculture as a whole, on marginal productivity analysis of aggregates (or simple averages) is of questionable validity.

The current emphasis on marketing research is spread over a wide range of marketing activities. In some quarters, interest is centered on the apparent temporal rigidity in marketing margins, their magnitude, and their relations to prices. These are questions the study of which cannot be successfully carried forward only by hypotheses drawn from the economic theory or behavior of the individual firm, since marketing margins also reflect group behavior

⁵ Some of the major references on this question are: F. W. Dresch, "Index Numbers and the General Economic Equilibrium," *Bulletin of the American Mathematical Society*, Vol. 44, February 1938, pp. 134-141. M. W. Reder, "An Alternative Interpretation of the Cobb-Douglas Function," *Econometrica*, July-October 1943; M. Bronfenbrenner, "Production Functions, Cobb-Douglas, Interfirm, Intrafirm," *Econometrica*, January 1944; J. Marschak and W. Andrews, "Random Simultaneous Equations and the Theory of Production," *Econometrica*, July-October 1944; L. R. Klein, "Macroeconomics and the Theory of Rational Behavior," *Econometrica*, April 1946; *idem*, "Remarks on the Theory of Aggregation," *Econometrica*, October 1946; Kenneth May, "The Aggregation Problem for a One-Industry Model," *Econometrica*, October 1946; Shou Shan Pu, "A Note on Macroeconomics," *Econometrica*, October 1946; Kenneth May, "Technological Change and Aggregation," *Econometrica*, January 1947; W. W. Leontief, "Introduction to a Theory of the Internal Structure of Functional Relationships," *Econometrica*, October 1947; David Hawkins, "Some Conditions of Macroeconomic Stability," *Econometrica*, October, 1948.

which affects the individual firms.⁶ Aggregative analyses are also called for, and dynamic rather than static theories are necessary.

III

Let us now turn to some general implications of aggregative theories for agricultural economists. Current discussions of employment and cycle theory are saturated with macroeconomic concepts such as savings, investment, multipliers and propensities. Regardless of what attitude one may take towards Keynes' formulation in his *General Theory* or the revisions and modifications by neo-Keynesians, it appears that aggregative analysis, which preceded Keynes, will also remain with the economic profession for some time to come after Keynes. This is likely not only because macroeconomic concepts and theories have a strong affinity to national policy problems, but also because microeconomics (e.g., Marshallian particular equilibrium) or Walrasian general equilibrium have not succeeded in providing concepts, tools, and theories which adequately deal in a usable manner with the type of problems handled by a simplified macroeconomic theory.

It would seem to me that it is important for agricultural economists to be at least familiar with methods of analysis and types of theory which in practice have and are very likely to continue to have an impact on national economic policy. Lack of sympathy with results of certain macroeconomic analyses, or disapproval of policy interpretations of certain macroeconomic theories, does not justify one's neglect of such theories. Contemporary developments in general economic thought are of significance to us as economists. We possibly could profit by seeking out from general macroeconomic studies those tools and elements that would be helpful in our own work.

It may be worth while to consider the development of aggregative

⁶ In this connection, the following statement is pertinent: "However, my main purpose is to identify a source of frustration in present marketing work. Most marketing research is concerned with efficiency. The frustration is the result of a problem in unit and interunit relationships in the field of distribution. Stated dogmatically, whatever inefficiency exists in marketing is rarely found in correctable form in the individual unit. The research worker thus comes, as he must, to the inefficiency of the complex of units that compose the market." This statement is from J. K. Galbraith, "Appraisal of Marketing Research," *American Economic Review, Papers and Proceedings*, Vol. 39, No. 3, May 1949, pp. 415-416. If "the inefficiency of the complex of units that compose the market" cannot be corrected at the individual unit level, an alternative is the evaluation of correctives applied to the aggregate; such evaluation would involve aggregative theories.

theories applicable to agriculture and which fit into macroeconomic theories concerning the economy at large. With the use of aggregates, and in terms of macroeconomics, Keynes claimed to have developed a logical explanation of the existence of macroequilibrium at less than full employment. This is a result at variance with neoclassical doctrine, but a result which had a marked stimulus on current thought. Hence, if there exists chronic unemployment in the agricultural sector of our economy, might it not be explained by some aggregative theory applicable to agriculture and which is consistent with a national macroeconomic theory? Usually, explanations of the existence of unemployment in agriculture are presented in terms of rigidities, frictions, and institutional influences, which undoubtedly are relevant, but they certainly do not comprise a theory.

The advantages of working with an appropriately constructed aggregative or macroeconomic framework should not be slighted. One advantage we have already touched upon. Relations or attributes of individual firms or consumers, or even of small groups of firms or consumers, need not be valid for the economy or large groups. The possibility of interaction within the group may give it a character different from that of each of its many components. Also, at the same time, we can often say more about the characteristics and behavior of an aggregate and predict more reliably its behavior than we can for the individual firms or consumers composing the group. The behavior of the aggregate is more stable than the behavior of the separate individuals. Hence, we have a better basis for the study of empirical relations and derivation of statistical uniformities. With respect to agricultural production-adjustments, marketing, and consumption, there may be group-behavior characteristics waiting to be discovered, the knowledge of which would contribute to our understanding of the agricultural economy and its interrelations with the nonagricultural sectors.

Some introductory work along this line has been done in sketches of behavior characteristics of the aggregate agricultural sector contrasted with the nonagricultural sector of the economy.⁷ Such

⁷ Theodore W. Schultz, "How Efficient is American Agriculture?" this *Journal*, Vol. 29, No. 3, August 1947, pp. 644-658; *idem* "The Economic Stability of American Agriculture," this *Journal*, Vol. 29, No. 4, Pt. 1, November 1947, pp. 809-826; Walter W. Wilcox, "The Efficiency and Stability of American Agriculture," this *Journal*, Vol. 30, No. 3, August 1948, pp. 411-421. Also, see: Trygve Haavelmo, "Quantitative Research in Agricultural Economics: The Interdependence between Agriculture and the National Economy," this *Journal*, Vol. 29, No. 4, Pt. 1, November 1947, pp. 910-924.

sketches, and inferences drawn from them, may be viewed as elements in a macroeconomic model which explicitly includes as variables functional relations within as well as between the agricultural and nonagricultural sectors. In this type of analysis, we approach macroeconomic theories which may adequately account for, in a useful way, the working of the national economy and agriculture's position in it.

The use of aggregative concepts has been criticized on the grounds that such procedure neglects the more important economic entities such as the individual consumer or individual firms. Some economists, for example, have attacked the Keynesian system for not explicitly recognizing the influence of the distribution of income. The criticism, I believe, is valid. But although the Keynesian structure does not directly incorporate income distribution as a variable, it does not follow that all macroeconomic theories need to exhibit a similar neglect. As macrotheories develop and as more variables are included, significant elements such as income distribution can be introduced. It may be noted, however, that burdening macroeconomic theories with too many variables will dissipate a major advantage of macroeconomics, mainly simplicity and manageability.

The simplicity of macroeconomic theories has been the subject of frequent criticism; it has been asserted that the models are so simple that they lose all semblance to reality. But such simplicity, if it is fully recognized, may well aid rather than handicap the analysis of economic relationships. Here, as in microeconomics, the danger lies not in the simplicity itself, but in the mistaken identification of the simple model with the complicated structure in which we are basically interested. The over-simple characteristics of a macroeconomic model are relatively easy to recognize and to bear in mind; whereas in the usual microeconomic analysis of the individual firm, for example, there has been a strong tendency to substitute the elementary model and its assumptions for the complexities of economic reality. A case in point is the marginal cost-marginal revenue explanation of short-run price and output determination by the individual firm.⁸

⁸ Of the substantial number of papers participating in the marginal-pricing controversy, the following may be cited. R. L. Hall and C. J. Hitch, "Price Theory and Business Behavior," *Oxford Economic Papers*, No. 2 (1939). R. A. Lester, "Shortcomings of Marginal Analyses for Wage-Employment Problems," *American Economic Review*, Vol. 36 (March 1946); *idem* "Marginalism, Minimum Wages, and Labor Markets," *American Economic Review*, Vol. 37 (March 1947); "Equilibrium of

An essential question is whether we can deduce useful generalizations from aggregative theories which cannot be learned from microeconomics. The answer appears definitely to be in the affirmative. This has long been recognized in business cycle theory. Regardless of the detail to which the theory of the individual firm or household is carried, whether it be a dynamic or static theory, it cannot explain, in a manner useful for making practical decisions, the levels and movement of employment, income, savings, investment for the economy as a whole nor variables such as "the" rate of interest. To study such important problems, and in our society they are of prime significance, our practical recourse is to the use of aggregates and analyses in terms of macroeconomics.

In connection with agricultural policy, the importance of national income and employment levels to agricultural prosperity is now widely recognized. The notion that national income can be advanced, in a permanent way, by special farm programs, no longer has the acceptance it received a few years ago. Now, most students lean toward the idea that, "High-level employment in non-agricultural industry means very much more to farmers than any 'farm-program' the government may attempt."⁹ This view leads us to the thought that macroeconomics is the appropriate framework in which to deal with some important aspects of the so-called "farm problem."

The "farm problem" might well in large part, though not entirely, disappear in the face of an over-all national economic policy which provides a relatively stable and high level of aggregate employment and income. Some farm programs involve the flow of government funds directly to particular agricultural producers or industries. But such programs are difficult to justify, from the national viewpoint, unless it can be demonstrated that injections of purchasing

the Firm," *American Economic Review*, Vol. 39 (March 1949). Fritz Machlup, "Marginal Analysis and Empirical Research," *American Economic Review*, Vol. 36 (September 1946); "Rejoinder to an Antimarginalist," *American Economic Review*, Vol. 37 (March 1947). G. J. Stigler, "Professor Lester and the Marginalists," *American Economic Review*, Vol. 37 (March 1947). H. M. Oliver, Jr., "Marginal Theory and Business Behavior," *American Economic Review*, Vol. 37 (June 1947). R. A. Gordon, "Short-Period Price Determination in Theory and Practice," *American Economic Review*, Vol. 38 (June 1948). Wilford J. Eiteman, "Price Determination, Business Practice Versus Economic Theory," Bureau of Business Research, Report No. 16 (January 1949), School of Business Administration, University of Michigan.

⁹ "Postwar Agricultural Policy," Report of the Committee on Postwar Agricultural Policy of the Association of Land-Grant Colleges and Universities (October 1944), p. 8.

power into agriculture have a greater multiplier effect and a more desirable distribution effect on aggregate income, than money injections into other groups in our economy.¹⁰ To my knowledge, such a demonstration has not been provided.

Since the macroeconomic theories proposed in recent years were developed to deal with the level of aggregates as employment, income, or investment, such theories throw little light upon the question of resource allocation. But that is a question which has attracted the attention of agricultural economists, especially in connection with the formulation and appraisal of agricultural programs. The distribution of employment between agricultural and nonagricultural pursuits, for instance, or relative wage rates in the two spheres, or relative prices of farm and other products, or relative costs and returns in the agricultural and nonagricultural sectors are relations pertinent to agricultural policy. Such questions and others related to the problem of resource allocation receive little aid from presently available macroeconomic theories. It would therefore appear that there is need for macroeconomic theories for analyzing questions of resource allocation. Such macroeconomic theories might prove more enlightening than a marginal productivity framework now usually used in the analysis of resource allocation.

IV

The preceding comments are not meant to imply that microeconomic analysis is obsolete and can serve no useful purpose in agricultural economics research or program-policy formation. On the contrary, it seems to me that as macroeconomics matures, and as we advance from a skeleton of macroanalysis to full-bodied macrotheories, it becomes equally pertinent that our tools of microanalysis and particular equilibrium be improved.

Economic problems in agriculture are so vast, complicated and varied in character that no one single approach will induce a complete understanding. For certain problems and questions, the knowledge of microbehavior is necessary, and in the study of such problems microeconomics remains the appropriate approach. Macroeconomics and microeconomics are not competitive approaches to

¹⁰ A somewhat similar point is made in Report of a Committee, "On the Redefinition of Parity Price and Parity Income," *This Journal*, Vol. 29 (No. 4, Part II) November 1947, pp. 1358-77.

the analysis of economic phenomena; rather, they are complementary and consistent with each other. Microeconomics and macroeconomics supplement each other in a manner as firm analyses and industry analysis or as the short run and long run are complementary.

But many significant economic problems are not wholly within a macroframework nor wholly within a microframework. Many problems lie largely within a penumbra which is bordered by both the micro and macrotechniques. Hence, a bridge is required so that we can easily transfer from one approach to the other. To accomplish such an objective, a really general theory, of which both macroeconomics and microeconomics are special cases, is required. But it should be sufficiently simple and so constructed that usable decision-making hypotheses can be stated and accepted or rejected by empirical tests. Such a general theory would not only bridge the present gap between micro and macroeconomics, but might also suggest paths of action from national policy to programs in particular industries and adjustments by particular firms.

USE OF ECONOMICS IN FARMING

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THIS is a joint meeting of Farm Economists and Farm Managers to discuss "Farm Management as an Art." The title implies a degree of management ability applied to farming that is above the ordinary—ability that goes beyond the mere application of rules and standard methods. Certainly, farm management cannot be lifted to the level of an art without unlimited use of economics.

This fact stands out with increasing vividness as farming becomes more commercialized and as the government takes an increasing part in managing farms and agriculture.

Production methods and techniques are successfully applied to individual farms by increasing numbers of farmers and farm managers. The response of the different soils to various treatments can be determined from published experimental data and verified by use on the farm. Methods of plowing, planting and cultivating are well known, and with modern machinery, can be repeated with an increasing degree of precision. Seed of known quality can be purchased. Chicks and pourets are purchased according to standard specifications, brooded under precision machines and grown with feed of known quality. Livestock breeding and feeding is done with more and more knowledge that certain practices produce specific results—the range of variability is being constantly narrowed.

This increasing control of production has been greatly moved forward by the commercialization of agriculture. Many of the most difficult jobs are now done by specialists working for large companies that standardize their products. The production of hybrid seed corn, chicks and pourets are examples. The mixing of feeds, fertilizers and pest control materials are commercial operations. Commercialization has certainly made a major contribution in stepping up production control on farms by providing efficient machines and equipment.

Dr. O. R. Johnson, head of the Economics Department of the Missouri College of Agriculture, in addressing Farm Managers last fall, told them—" . . . land itself resembles more and more an empty factory building like Willow Run before Kaiser-Frazer moved in. What the farm operator does in the space provided is

becoming much more significant than any inherent qualities which that space may possess."

The production side of farming deals largely with tangibles. In contrast to this, the economics end of the business deals with intangibles that cannot be nailed down into definite formulas or carried through with precision machines and equipment. Economic forces controlling prices may be cut across any day or any hour by local, national or world events. All calculations of a farm manager may be changed by a new law or an administrative decision of a governmental official or board. As compared with the production part of his job, farmers and farm managers continue to swim in a sea of economic uncertainty.

This does not mean that progress in the field of economics has been less than in production. These facts are set forth to show the great need of farmers and farm managers for economics. This need extends far beyond their own abilities and the resources available to them on the farms or through their organizations.

It is in recognition of this fact that state universities and the U.S. Department of Agriculture have developed agricultural economics departments. Farm organizations have their economists. Financial and commercial firms supplying farmers with services and supplies are more and more attempting to provide economic guidance to farmers and farm managers. They need all the help they can get—much more specific and timely advice than they are now receiving.

Note in that last sentence, I used two words of importance—"specific" and "timely." This entire paper could well be used to discuss either. Too many economists are either so uncertain of their judgment and information or so unwilling to risk their professional standing that they fail to be sufficiently specific to be of great help to farmers and farm managers.

Farm operations must be projected long months ahead. Too much economic information is both "too little and too late." Farmers are making their decisions now on buying feeder cattle and lambs to be sold in 1950. Last April and May, they were breeding the sows to get pigs to sell in 1950. The outlook conferences and publications for 1950 will be issued after many of these decisions have been made. This fall, farmers, ranchmen and dairy farmers will be saving back or buying cows and heifers for beef or milk, based on returns they expect to get during the next three years or

more. How much specific advice do they have now to help them make these vital decisions?

With these broad statements as a background, let's look briefly at some of the economic developments that indicate how farmers and farm managers will be using economics in farming.

Industrial production and business trends outside the field of agriculture are known by every competent farm manager to be of vital importance to his success. Demand for various farm products goes far in determining whether prices of the products he is producing will be profitable or not. Farm managers and the most alert farmers are therefore hungry for those expressions of judgments regarding longer time industrial and employment trends that some economists are now issuing. Right or wrong, they want to know what the most competent economists see ahead. The individual farmer and farm manager has little basis for forming a judgment of his own.

Too much that is being said for the press or on the radio is unfortunately tinged with propaganda. For example, some high officials treat citizens like children, "for fear of talking the country into a depression," and put out half-truths and only part of the facts. Farmers and small businessmen go forward half blind to the true situation. That can lead to disastrous management mistakes.

The population is rapidly growing. We are 10 years ahead of schedule on population growth and we are adding over one million people per year. Farm managers are watching not only the total population numbers, but the relative proportions of youth and old people in trying to gear their production to the diets of the people.

The productive capacity of our farmers has moved ahead at a rapid rate. With normal weather, they can feed all the people, regardless of the rapid population growth. Production is running over 30 percent above pre-war, and it will continue at a high level. A new all-time high in crop production was set last year. This will be another record or near-record crop production year.

You know the effect of mechanization, improved seeds and more efficient feeding. Now the use of chemicals holds the possibility of greatly expanding farm production. The growing use of fertilizers is also a major factor. Farmers have been given a liberal education in the use of fertilizers as they have profitably used them during and following the war period.

Alert farm managers know they are in an efficiency race. They

must drive down costs and increase quality. Only the most capable farmers will survive with a decent standard of living.

It now takes cash to farm. Self sufficient farming is gone from commercial farms. For almost every operation cash costs are involved. Will farmers continue to produce when prices drop? Or will they let tractors stay in the shed and land lay idle? Will we shut down farms like factories shut down when the selling price of crops goes below costs?

Farmers never have closed down—will they in the future? I expect to see that happen—idle land and idle equipment.

The impact of the foregoing facts will be most acute in cash crop production areas like the wheat lands of the Great Plains. When either drouth or price prospects indicate that cash production costs will not be returned, farmers and farm managers will shut down their farming or cut production until more favorable conditions return.

The break-even point in farming is higher, much higher than before the war. Even the drops in prices that have already taken place will put many farmers in the red.

Dr. Sherman E. Johnson, when Head of Farm Management in B.A.E. in Washington, was concerned over this development. 1948, ". . . was the first year in a decade that gross income failed to rise more than costs. Consequently, farmers can't reduce their cash outlays during a price squeeze in the same way that they did formerly. Today, fuel and oil and repairs for the farm tractor are out-of-pocket expenses. A larger share of family living costs also are cash expenses. Most farms now have electricity, and fuel for the farm furnace is delivered by the oil man or the coal dealer rather than being cut from the farm woodlot. Farm real estate taxes . . . have been rising for four consecutive years."

" . . . the young man who is getting started in farming will have to invest two or three times as much for land, equipment, livestock and supplies as before the war . . . heavy debt on such an investment could be an unbearable burden."

In the present declining phase of the economy, every alert farmer and farm manager should be refiguring his individual farm enterprises as well as his total farm business to establish in advance the probable break-even points. All the specific help that economists can give regarding future prices and costs will be useful farm management tools.

Flexible farming is being advocated. Iowa State College says, "The puzzle of uncertain prices is still with us. . . . Today, more than ever, it is smart farming to keep your business flexible—flexibility and short-term production methods can be combined even in construction of farm buildings."

We are saying to farmers—Keep your operations pliable. Avoid being caught in a profit squeeze due to a rigid pattern of operation that cannot be varied sufficiently to meet shifting conditions. Changes in crop production and carry-over; increases or decreases in the number of hogs, poultry, cattle and sheep; shifts in consumer demand and exports; AND changing government laws, rules and regulations are just some of the reasons why there should be flexibility in your farm program.

Have a basic plan of operation adapted to your farm, ranch or plantation. But, be sure flexibility is provided for in the plan. One very important reason for flexible farming is that governmental regulations lag behind the need for action six months or more. There will be these periods of serious maladjustment in prices and regulations regardless of the political party in power.

Increasing specialization in farming enables farmers and farm managers to become more keen students of economics for the products which they produce. As a result, they will cut back and expand production much more freely than in the past.

As I have already pointed out—the old days of production, regardless of price, may be over for some commercial farmers. Cash costs of farming—with the use of economic facts and forecasts—may cause specialized farms to expand or contract production like industrialists have always done in factory operations.

Price and production controls by the government, of course, will become increasingly dominant. In many cases in the future, price "floors" will become top prices. Floors will become ceilings. Too many small producers will find themselves subject to discounts or prices below those set by the government, as enforcement breaks down or price regulations are avoided.

Profits or losses in the years ahead will be strongly controlled by forces operating beyond the control of farmers and outside the boundaries of the farm. Washington legislators and officials will continue to conceive "Bold New Programs" and move closer to a welfare state. Farmers and farm managers must go beyond economics and try to out-guess political strategy and maneuvers. Re-

gardless of the political party in control, there will continue to be a high degree of uncertainty about what the government will do, and when.

For example, who would have expected turkey growers to be bailed out with good profits with a 31-cent price support after they disregarded all government forecasts and warnings showing the over-expansion in turkeys that was taking place this year?

An example of price discounts was seen in the excessive cuts made in the price of wheat for moisture and such impurities as garlic.

For several years, alert farm managers have been jockeying for a favorable acreage allotment when controls return to high profit crops. They have, of course, been kept almost completely in the dark about what would probably be the basis of allotments.

Rules of thumb are sorely needed by farmers to guide them in management decisions. They should be brief and to the point. Farmers use a lot of them now, but they need to be brought up-to-date and extended by economists, who are in a better position to make them than anyone else.

The old 10 to 1 for corn and hog prices is still in use. Few farmers know, in such simple terms, what efficient producers can expect.

Dr. Stanley Warren of Cornell University has a rough guide, which he gives his appraisal classes, of \$400 to cover the farm investment per dairy cow.

There is evidence in some ranch areas that the real estate investment must be held to about \$150 per cow for practical operations.

We say that animals can afford buildings that cost about as much as the annual gross income per producing female. There are variations such as \$250 buildings for \$200 annual income dairy cows.

How much price increase must you get before you can afford to store wheat, corn, oats, soybeans or cotton?

Such economic guides, quick and easy to use, even though often crude, are invaluable tools that more farmers need to be using in the management of their business.

Farm management must be lifted to the level of an "Art" by those farmers and professional managers who will be successful in the difficult days ahead. Only those who use dependable economic guidance can be assured of profits.

Most farmers and farm managers have neither the background nor the time to master and keep up with the economic information which they need. They must increasingly look to economists who regularly get farm dirt and manure on their shoes to understand the management needs of farmers, and who get the economic advice to them in simple, easy-to-understand terms. The advice must be in their hands when needed, and be specific.

With such aid from economists, able managers of farms will then decide what action to take. Able managers know that economists cannot always be right when they draw conclusions regarding the future—but they want their best judgments. Otherwise, they are blindly managing insofar as much of the economics applying to their farms are concerned.

THE MISSOURI PLAN (BALANCED FARMING)

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THE Missouri Extension Service taught individual farm practices, as did all state colleges, until 15 years ago when the need became apparent for a system of farming that would tie together all of the good practices recommended by the college for a farm in a way to give the greatest net income consistent with continuing improvement of the soil. Throughout the years certain farmers have specialized in beef cattle production and perhaps failed to improve their pastures, and others specializing in crop production failed to receive high net income because of poor feeding practices. The college, with its traditional 12 to 14 departments and Extension specialists for each, undertook to save the farmer by teaching the individual practices, leaving it to the county agent or the farmer to tie these practices together, if any attempt along that line was made.

This idea of developing a system of farming, called in many states Farm and Home Planning, is called Balanced Farming in Missouri. The objective has been to achieve a balance between input and outgo of soil fertility; between type of soil and crops; between pasture and crops and the livestock system; between the livestock system and the desires and abilities of the operator and his labor supply; between net income and the needs of the farm family; between good planning, hard work and a comfortable, attractive home.

The Balanced Farming program has been handled largely by a committee of specialists and supervisors, with a soils specialist as chairman. The program does not belong to the farm management or any other department. Each specialist has an opportunity to push his line of work to the limit but does so in cooperation with other specialists in developing systems of farming. The dairy specialist has come to recognize that the dairy farmer will not succeed unless the soil is improved to enable an abundance of good feed to be grown for low cost production. Crops and soils specialists recognize that improving the soil and growing an abundance of feed is of no avail unless there is good livestock management to get the most dollars out of the increased feed production.

Back in 1936, 22 specialists and supervisors spent four days in

teams of four men, each planning farms and arguing over the plans. Since practically every specialist had been a successful county agent, it was not long until the poultry specialist knew how to lay out a good water management system; not that he expected to do that, but in order that when he talked to county agents and farmers about new poultry practices his recommendations would fit into an over-all plan that took care of erosion as well as raising healthy pullets. The swine specialist quickly recognized that preaching hog sanitation is a futile gesture unless there is a system developed on the farm whereby there will be at least three fields as a minor rotation of corn, small grain, and clover. This provides good pasture and clean ground. Each field must be fenced hog tight and provision must be made at the outset for water in each. Whereas our service preached hog sanitation for years prior to Balanced Farming, our results were very scanty; but now with Balanced Farming we help the farmer plan for hog sanitation so that it is the easy and natural thing for him to do with his hogs.

Naturally, in the early days of Balanced Farming, we started by means of demonstrations, schools, and all the traditional Extension methods. One concept has been held to throughout the years. It must be the farmer's own plan. Even though it takes much longer for the county agent or associate agent to stay with that farm family until they think through what they want to do and why, than it would for the agent to plan the farm, it's the only way to do it if we expect the farmer to do anything about the plan that is made. Changing economic conditions mean that plans must be changed. Therefore if the farmer does not help make his plan he does not know how to change it when he should. He will simply lay up his paper plan on the mantle by the clock and let it gather dust.

I do not think it necessary to go into detail with this group as to how a county agent and the farmer work out the plan. It must be remembered that in our state we have freezing and thawing throughout the winter, with torrential rains through the spring and fall, and are subject to drought in late summer. In addition, most of our state is quite rolling, all of which means we have a terrific erosion problem. No farm plan is complete without a water management system that will provide terraces for at least all fields that are to be used for row crops. We have four Extension agricultural engineers whose job it is to see to it that all county agents, associates, and assistants, have the latest information and

skills on water management with which to assist their farmers. This means of course that it is more difficult in our state to develop farm plans than it is in the states north, east, and west of us which do not have this tremendous erosion problem. What I mean to say is that if Missouri can develop farm and home plans, as it has, there is no reason why other states, with the possible exception of our neighbors to the South, could not do so more easily. While water management is fundamental, our agents start a farmer wherever his interest is greatest. If he is a dairyman, they get him started in the cow test association, in the artificial insemination set-up, with a real dairy feeding, breeding, and selection plan, then lead him on to the needs for better pastures and more feed, showing how soil fertility must be improved to get the extra feed, and how foolish it would be to lime and fertilize soil and then let it wash off.

I trust I have made it clear that Balanced Farming is much more than a soil conservation plan. Balanced Farming gets soil conservation but it gets the highest net income possible first and gets soil conservation as a by-product. There is not necessarily any direct connection between a plan that will give soil conservation and one that will give high income. A farm could be seeded down to timothy and it would save the soil, but the family would starve to death. On the other hand, you cannot have a successful long time Balanced Farming plan, unless the soil productivity balance is increasing. We have simple formulas in our workbook so that each farmer can test this for himself.

To be specific, Waldo Woolf of Warren County, Missouri, had a thin 160 acres that would produce feed enough to carry 10 dairy cows. With his county agent he developed his Balanced Farm plan and by the use of lime and fertilizer, clover, better pasture systems, and a water management plan, six years later the same farm fed 22 dairy cows much better. At the outset of the plan the 10 cows produced slightly over 200 pounds of butterfat per cow. Careful planning and selection of the best heifers, culling out of the poor producers along with a real feeding program, meant that at the end of the six year period the 22 cows had moved from slightly over 200 pounds of butterfat per cow to 419 pounds. That, in a word, is Balanced Farming—moving from 10 cows producing 200 pounds of butterfat per cow to 22 cows producing 419 pounds of butterfat per cow. I need not tell you that quadrupling the gross income means much more than that in terms of net income.

Then there was the Robert Jennings family of Lawrence County, whose 120 acres in 1943 supported 14 mature cows when they started their Balanced Farming plan. By 1947 this farm carried 21 mature cows with 12 heifers. They went from 50,800 pounds of milk in 1943 to 109,000 pounds in 1947. By soil and crop improvement they raised the carrying capacity of the farm 50 percent but at the same time by good herd management they raised the milk per cow from 4200 pounds to 7200. In 1943 they used 2500 pounds of fertilizer, in 1947 they used 9400 pounds; in 1943 they used 12 tons of lime, and in 1947 they used 43 tons. In 1943 they had no terraces, by 1947 they had practically two miles of terraces built or in the process of being built, with three quarters of a mile of terrace outlets ready to receive water from additional terraces. Using 1947 prices, their gross farm income in 1943 would have been \$3386 and by 1947 this was increased to \$7380. Their net farm income rose from \$2390 to \$4632.

Bob Maledy of Dent County, one of our Ozark counties, with his Balanced Farming plan through better pastures and better herd management increased the weight at weaning time, on beef calves, 90 pounds per head. His neighbor, Henry Meyer, with 21 beef cows produced 21 calves which at an average age of 262 days had an average weight of 604.2 pounds. When 8½ month old calves weigh better than 600 pounds on the average, you are getting beef produced and that is what Balanced Farming will do. Back in the late '30's before war prices, Charlie Schaefer of Lafayette County, with his Balanced Farming plan moved in 5 years from a 15 cow beef herd to a 40 cow beef herd and his net income from \$1150 to \$2266.

Tom Ream of Pettis County, with his Balanced Farming plan, was able to save one more pig per litter with his pigs on clean ground and to market them weighing 225 lbs. each a month sooner than he had prior to using the plan. His neighbor with a secondary rotation of three 10 acre fields, one with clean clover pasture for his hogs, was able to make each 100 pounds gain with four bushels of corn and 15 pounds of tankage, in addition to the clover. That means net profit in anybody's language. The alternate poultry yard and farm garden has meant much to our farmers. The $\frac{1}{2}$ -acre field that was the poultry run last year is the garden this year. Last year's garden is clean ground for this year's pullets.

We have made lots of mistakes in the development of our pro-

gram and one of them was to assume that it would be better to start the agricultural part of Balanced Farming first and bring in the home side later. We are now making every attempt to rectify that mistake. The object of Balanced Farm planning is better farm family living. Therefore, we start today figuring what the family needs in the way of income to buy the things they need. If the old plan doesn't produce this necessary income then a different plan obviously must be worked out. Small farms naturally must go into intensive systems of farming. If the operator doesn't like intensive systems then it is now clear to him that if he is to have a decent living, he must have more land or change to intensive farming.

I spent last Thursday in Osage County, Missouri, where 10,000 farm people gathered at a Balanced Farming Action Day in what is known as Deer Creek Valley, where five adjacent farms have complete Balanced Farming plans in operation. It was a wonderful sight to see the farm homes with all the labor saving devices that had been developed since they started Balanced Farming. Of the 300 farm families now doing Balanced Farming in this little border Ozark county, over one-third have built new homes or remodeled the old ones. Their plan provides the family a high plane of living, electricity, water under pressure in the home, a kitchen sink, bathroom, and plans for health and educational needs. I mention this since we recognize now that farmers must necessarily move slowly as funds will permit in making the home improvements. It is therefore absolutely essential that a plan be developed as to when these things will be done. Otherwise, less important things will take the funds, the farm woman will become prematurely old, and the youngsters lose their interest in the farm. I wish again to point out that, important as improving the soil may be, more important is the health, happiness, and well-being of the farm family. And I have no hesitation in saying to this group that those of you who believe that income alone will bring satisfactory farm living are terribly wrong. It takes careful planning that must be tied in with the over-all plans for the farm. We have tried it both ways. It works when the two are tied together; it doesn't work when they are not. We want the farm woman in Missouri to help with every step in the farm plan and her husband to help with every step in the home plan. This also goes for the older children. It must be a family approach. This calls for real teamwork if it is going to succeed, at least in a state with the type of restricted resources that Missouri has.

This was well illustrated in two Balanced Farm planning schools that were held for county agents and home agents in South Missouri some years back. At the first school the county agents worked together on developing a practice farm plan on an actual farm while home agents worked on the home plan for the farm. Then each group presented their plan for the other's consideration. When the home agents presented the cost of home improvements needed, the county agents whistled. They had not seen the need and they had not anticipated such expenditures in their plan for farm operations.

Two years later a similar school was held with many of the same agents attending, but this time county agents and home agents worked together in groups to obtain an understanding of all phases of this farm and home planning job. This time when various groups of agents presented the plans they had developed there was no whistling, even though costs for home improvements were larger than before. The men agents knew the needs of that farm home and the women agents knew the income producing possibilities of the farm, and since both had worked together a very important balance has been reached—a balance between the farm and the home. And of course the importance of this family approach is not lessened when it is the farmer and his wife and older children working together on the plan.

We know that we can move production up on the average of 25 to 75 percent by Balanced Farm planning. Our problem is, how can we move more rapidly—how can we interest more farmers? We have 114 counties in our state and we have Balanced Farming work going in every county. However, in 1946 we started in one county with what we call a Balanced Farming Association. Fifty farm families banded together, paid in \$50 each, the businessmen of the community put in \$1250 and the Extension Service put in \$1250 to provide a \$5000 fund with which to hire an associate agent to help these 50 farm families set up Balanced Farming plans. This has been the most helpful device we have found to move sound farm and home planning. In 1947 we had 17 of these associations, in 1948 we had 29, this year we have 37, next year we will have 46. This would represent 45 different counties—one county has two associations. This growth testifies to the effectiveness of this method.

When a farm family puts in their own money to help employ an associate agent who in turn helps them develop a farm and home

plan they are ready to move. People value things that they pay for with money or in work. The things that are given them are not valued so highly. This, I think, accounts for the fact that it is in these associations that we have made real progress in Balanced Farming. Take for example, Lafayette County. They had two Balanced Farming associations in 1948. The county built 269 miles of terraces. The 20 county soil districts in our state built a total of 520 miles of terraces in 1948 according to the SCS reports. Among the 114 counties in the state using nine measures of soil conservation, Lafayette County ranked first in three of them. It was first in miles of terraces built, first in acres contoured, first in terrace outlets built, 6th in tons of limestone used, 7th in number of farms contoured, 10th in number of ponds built, 11th in total acres of sweet clover, 12th in acres of green manure turned under and 15th in tons of fertilizer used. I simply use this as an example to indicate that there is correlation in our state between the progress in conservation, in soil improvement, and in the number of these associations a county has. It is also interesting that in 1946, the same county that first started a Balanced Farming Association started our first soil testing laboratory. Today we have 60 county soil testing labs where a farmer can learn from his own county agent the kind and amounts of fertilizer needed for each of his fields. This is a tremendously significant development and is another by-product of our Balanced Farming program—to help people to help themselves. In the four years since we have started these labs we have increased fertilizer use 50 percent. Missouri is today using 10 times as much fertilizer as it did 10 years ago.

Certainly we have had our ups and downs with these associations. Some have failed, principally because we did not have men available of the type essential to make a success of one of these associations. It takes the very highest type of a county agent. He must be able physically, as well as knowing farming from the ground up, to handle this job. We have 38 of them on the job today and as I said a minute ago, expect to have 46 on the job next year. As the years go by, however, we are going to have the best trained bunch of county agents anybody has ever seen, since it takes real men to do this job. This associate county agent turns first to his county agent and home agent when he hits a hard problem. He is not a superman. If they still have trouble, they have first call on our specialist group for we believe that we have men who, in their

respective fields, know the answers better for the state of Missouri, in water management, farm management, soils, field crops, dairying, animal husbandry, etc., than can be found anywhere else. It is their job to keep these county workers sound. It has been a tremendous challenge to our specialists. They have responded in a magnificent way. As our soils specialist, the chairman of our Balanced Farming committee puts it, "Let's quit fooling with these darn meetings and get out on the farm and get something done."

The essential philosophy in this Balanced Farming approach is that the welfare of the farm family comes first, that you will never improve and conserve the soil unless farmers determine to do it themselves largely with their own resources; that it is just as essential to have a blueprint for the improvement of the farm and home as it is to have one with which to build a barn or a house.

There is one thing of which we are certain and that is that we do not have the final answer. We are convinced that our present methods are effective, but we wonder whether there are not still better ways of getting the job done. We are experimenting right now with a number of different ways of doing farm and home planning. In one county, for example, we are trying out a somewhat less intensive method of planning. The agents in a single year have 85 farms well under way. These are in separate school districts and we expect to try within another year an experiment to see how much we can do in using these 85 men as local leaders who would be willing to help a half-dozen neighbors in setting up their Balanced Farming plans. We are experimenting with this in the hopes that some day the government might recognize that you could put on a great voluntary program of farm planning where you could really get soil conservation and get it paid for at the same time; where you could get real crop adjustment through mass farm planning. It is perhaps wishful thinking that a thing so inexpensive and so simple could ever be incorporated in an over-all farm program. But we know we could make it work in Missouri, so we go on working and hoping that we might have this chance, because with it or without it, we know we are doing one hundred times better Extension work today, getting more practices adopted every year than we ever dreamed of getting before we started with the Balanced Farming approach.

Among the things that we have learned is that to have progress in a venture of this kind facilities must be available. Among those

facilities, I would include farm management companies who will work with the larger farms, the non-resident owner farms, and the farms that would require the close farm management attention that our county agents cannot, or at least should not, give. In our state we have 325 soil moving contractors. They have their own contractors' association, many of which men are former county agents. They have put their money in machinery to build terraces, soil saving dams, ponds, drainage ditches, and that sort of thing. They have the know-how, they can do the work much better than the farmer can do it for himself, and in general we believe it will pay a farmer to hire one of these men and use his own time in developing his livestock enterprise or other things on the farm that will bring in the money with which to pay his contractor. Fertilizer dealers have been a great help in our whole program. In turn we are asking them to stock the kind of fertilizer farmers should have and they are doing it. We must include businessmen in a program of this kind. Our businessmen, particularly our State Bankers Association, help support the Balanced Farming associations. Again, when a man puts his own money into a thing he is proud of it. He talks about it. He boosts it, and all of this helps carry the program. We believe the development of Balanced Farming around any agricultural town helps more than the bringing in of any type of factory or anything of that sort that they could possibly find. Why not allow them the privilege of investing in a really sound development program? Incidentally, we have more difficulty in selling our farmers on this idea of allowing the businessmen to help finance an association than we do the businessmen.

All in all, we believe that the development of the Balanced Farming program has been one of the great things that has happened in our state. We were barely started when the war years took away our younger county agents and pretty well stopped our program. Since the war we are getting under way again and have more than 20,000 farm families in some stage of a Balanced Farming program. It takes years of hard work for a farm family to get a really good program under way. It takes the constant encouragement of the county agents to keep them working at the plan once it is made.

We look forward to the day when a couple of hundred of what we call "graduates" of our Balanced Farming associations may form a more extensive type of association in a county and pay all of the salary of their associate county agent, a man with particular train-

ing in Agricultural Economics, who will not only help keep them on their plan but help them really use outlook information. Such an association would work in groups more than is possible or necessary with the small associations when the individual plan is being developed and started.

As I stated before, we do not know all the answers or any considerable number of them about getting farm and home planning done; but we do think it is the soundest and most fundamental approach, both from the standpoint of the farm family and from the standpoint of the Extensive Service, that we have ever had. With the advice of our farm people we expect to keep on improving our techniques until some day you can ride down *any* of our roads and see good farming and good homes—Balanced Farming—on every hand.

ECONOMICS FOR THE FARMER

LAUREN SOTH

The Des Moines Register and Tribune

MOST of us who are members of this Association are engaged, one way or another, in trying to inform farmers about the economic factors affecting their businesses. It is surprising, therefore, how little time we devote to studying the best methods of doing this job. If we are to raise the general level of understanding of economic facts and principles, we cannot be satisfied merely with increasing the supply of information. We must also be concerned with our responsibilities of exposing the public to the information and of increasing its rate of absorption.

The reasons why it is important that we do a more effective job of transmitting economic information to farmers are self-evident: first, to help them adjust their individual business operations more rationally to a changing economic situation; and second, to help them make sounder judgments about governmental activities in agriculture.

I

When agricultural prices and land values flopped badly after the first World War, the demand for economic information grew enormously. The commercialization of the farming industry had long since reached a point where farmers were conscious of their relationship to the business cycle. There had been agitation for monetary inflation and other kinds of farm relief during the last half of the nineteenth century. But no previous price-cost squeeze had quite the impact on farm thinking of the 1920-21 affair. Farm people began to wonder about the factors which determined their prices. This was the period of heaviest assaults on the packing companies, the grain exchanges, the banks and other institutions which farmers believed were responsible for their difficulties. It led to the flurry of farm co-operative organization, to the McNary-Haugen episode and all sorts of plans for raising farm prices.

It also led to the first systematic effort to educate farmers about economic conditions which affected them. The Wallaces, Henry C. and Henry A., were prime movers in the effort to provide agriculture with more and better economic information. They began to publish charts of "hog profits and losses" in their farm paper, and later added similar diagrams on beef cattle and butter. Later

Henry A. Wallace added statistical information about general wholesale prices, industrial production, employment, carloadings, and other indices of business activity. He also began to publish his own forecasts of prices.

In 1923, Henry C. Wallace, as Secretary of Agriculture, called the first national farm outlook conference. The first outlook report covered only demand conditions and price prospects for wheat, cotton, tobacco, corn and hogs. Little effort was made to give it widespread circulation among farmers.

At the time this outlook work was getting started it was felt by many farm leaders that farmers would make the proper adjustments in crop acreages and livestock programs if they had the facts before them. They thought adequate economic information would prevent surpluses and help stabilize agricultural prices by making the market a more effective instrument for balancing supply and demand. There was even a "forward price" proposal advanced at this time to make the outlook work more meaningful and effective—and to reduce uncertainty in the farm business.

Of course a more perfect market was not the answer to the farm depression of the 'twenties. But because outlook work had been advocated as a panacea, it was discredited when farm conditions didn't get any better and then went from bad to very much worse in the Great Depression of the 'thirties.

Agricultural leaders turned their eyes toward federal government action to adjust production, along with purchases and loans to support prices of farm products. The theory behind these programs was that the free market couldn't be made to balance supply and demand. The idea, in contrast to that embodied in outlook work, was to substitute central direction and management for the automatic regulation of the market.

Although it may be true that the free market system is inadequate to direct the necessary adjustments in agricultural production and marketing in a time of violent economic change, it is fair to say, I think, that we have never done our utmost to try to make it work more efficiently. We haven't given the free market a really fair trial, for it is implicit that a smoothly functioning free market must have as its basis complete, accurate, understandable, and timely economic information to producers.

Neither our national government, our educational institutions, nor the press have been able to achieve anything like a satisfactory

dissemination of such information to farmers. Strangely enough, some of the groups and institutions which argue most vehemently for the free enterprise economy are least willing to spend money in a genuine effort to make it work in agriculture.

II

Paradoxically, the AAA programs have accomplished many times as much in acquainting farmers with economic information as the Extension Service has in all its 26 years of organized outlook programs. Whatever the AAA programs did or did not accomplish in the way of production control, they certainly did provide many farmers who never before had been reached by any educational agency with basic knowledge about the American economy and agriculture's place in it.

Each year in order to get compliance with its programs, the AAA brought to farmers in simple terms the supply and demand situation affecting the crop in question. The interpretation was slanted, of course, to induce farmers to go along with the adjustment. But still farmers were made aware of relationships and magnitudes—the impact of the foreign market, for instance, which they had not previously thought about. You who have worked with farmers during the last 20 years will bear me out on this.

This achievement in the field of economic education by the national farm adjustment programs is something which it seems to me deserves study. What are the reasons why AAA could interest farmers in the foreign market for wheat, when Extension couldn't? You cannot dismiss this question merely by saying AAA had the money, and farmers were interested in their pocketbooks. There is more to it than that.

One reason why AAA was more successful in economic education than the Extension Service was that it used local farmers to do the job. Local people know best what their neighbors are interested in and how to approach them with new information. Extension has always prided itself on its local leader system, and apparently this system has worked well in spreading information about farm production practices. But for some reason, the Extension people were never able to get this job done on *economic* information.

Why was the AAA able to get local leaders to do this job which Extension had been unable to do? Well, the committee-men were paid, for one thing, and Extension's local leaders were volunteers.

But aside from this, AAA had a definite sales argument to put over. It was shooting at a definite goal. The AAA workers were not troubled with doubts about the correctness of their program. They didn't try to bring out the "other side" of the question. Instead, they did their best to sway farmers to their way of thinking. There was a dynamic, crusading movement, and it had a highly interested audience during those depression days. It attracted workers just because it was new and dynamic. Alongside it, the Extension outlook story was drab and dull.

Opinion researchers have found that no matter how skillfully an information campaign is waged, it will fail unless it is geared to the public's interests. All of us know from experience, also, that people learn more in discussion of "hot" or controversial issues than they do when they aren't emotionally worked up about them. We know from the mail which comes into our newspaper that controversy results in a much higher degree of knowledge. The recent outburst of Cardinal Spellman against Mrs. Eleanor Roosevelt unquestionably stimulated thousands of people to become better informed on the issue of public aid to schools, as well as upon the questions of religious freedom and separation of church and state.

The heated arguments over crop acreage control and other aspects of agricultural policy contributed to the wider spread of economic information through the AAA system—both among friends and enemies of the program.

When public interest is high, when controversy is alive, that seems to be the most favorable climate for getting across information. But there is one danger in trying to reach people on the basis of their interests alone. People nearly always seek information congenial with their prior attitudes. They select material to read which fits in with their own biases, and they go to meetings or listen to radio programs which strengthen their own convictions. Thus it is easy for educators, or others in charge of information campaigns, to be misled as to the number of people they are reaching and as to the amount of information they are getting across. The AAA has fallen for this to some extent, I believe. It has done a good job of educating the loyal followers of its programs, but it may not have reached out as far into the byways as it believes. The older AAA becomes the more it falls into the same rut as Extension or any other agency. It clings to its permanent "clientele" and to the methods and techniques it has used in the past.

There is supposed to be a high pitch of interest among farmers in agricultural price programs right now. The last election, according to the experts, was swung to the Democratic side primarily because Midwest farmers didn't like the Republican performance on farm legislation. The Democrats held a big shindig in Des Moines to sell the Brannan Plan and capitalize on this feeling among farmers.

Yet a Gallup poll just over two weeks ago showed anything but a burning interest among farmers in price support programs. A sample of Midwest farmers were asked whether they had been following the discussion of the Brannan Plan and what their opinions of it were. Less than half of them, 43 percent, said they had been following the discussion. Fifty-seven percent had little idea of what the plan was all about.

This should not be so surprising to us when we realize how slow the spread of even simple production information is among farmers. A large number of Iowa farmers still don't feed balanced rations to livestock. It took many years for Iowa farmers to adopt hybrid seed corn, even after it had been proved. We should not expect farmers to follow and grasp complicated economic ideas like the Brannan Plan within a few months. Yet many of our information programs are handled as though *every* farmer were deeply interested, able to start at the same point, and equipped with all the background that the best informed farmers have.

III

The National Opinion Research Center concluded, in the study referred to earlier, that there exists in our population a hard core of chronic "know nothings." Surveys consistently find a certain proportion of the public which is not familiar with any particular event or idea. This group of "know nothings" is the group which we do not reach with the newspapers, the radio, in meetings, or any other way. There is something about these uninformed people which makes them harder to reach, no matter what the level or nature of the information.

Considering the amount of space which the newspapers give to the national debt, the federal budget and related information, I was shocked recently to see a Gallup Poll report which indicated that nearly two-thirds of the people surveyed (64 percent) would make no estimate of the federal budget for the last year. Only six percent were able to place the budget correctly within a range of 35 to 45 billion dollars. Another 30 percent guessed the budget out-

side this very wide range. About the same percentages of ignorance were shown on information about the national debt. Only seven percent of the people were able to place the debt in the range of 225 to 275 billion dollars.

Lack of knowledge of the figures does not mean, of course, that many of these people do not have some concept of the issues in fiscal policy, but it surely is an indication that this kind of information is not widespread.

The size of this bloc of "know nothings," added to the still larger bloc of those who know *little* about economic information is something that newspapermen, educators, and politicians need to give more attention to. The farmers who have inadequate economic information still make decisions about production and marketing on the bases of prejudice, hunch, and guesswork. They make political decisions on the same inadequate grounds—decisions about farm programs, about international trade policy, and about industrial and labor policy.

The problem is both a matter of making democracy work better and of making the free market system in agriculture work better.

IV

Unfortunately, we know very little about how to go ahead with this challenging assignment. We need first of all research on how farmers get information about markets, prices, general business conditions, and so on. Then we need research on how they use this information to form their judgments.

In the absence of better and more scientific groundwork, it seems to me that state college Extension Services and other agencies dealing with farmers could learn something from the experience of the last 15 years.

For one thing, it appears to me that the Extension Services will never do an adequate job of economic education until they become bold enough to deal with controversial issues. I am not advocating that they try to promote a particular point of view, as institutions, in the manner of the AAA. But I do think they ought to give individual staff economists complete freedom to express their views as they see fit on questions of economic policy—insisting only that the *basis* for these views be accurate and unprejudiced facts. Too many of our economic research and Extension programs are circumscribed by the political forces in the states, working through the college administrations. I have seen a good many economic

education programs bog down because they were so insipid. They lacked drive and carry-through because staff members did not feel free to take a position and argue it if it happened to be unpopular with politically-powerful groups. I believe more could be accomplished in economic education among farmers if more economists were free to stand up and be counted on the hot issues.

I have used the AAA as an illustration of this more vigorous and more effective educational approach. I could also cite some of the work done by some labor unions during recent years, and increasingly by farm organizations.

College administrators spend too much time worrying about the *effect* of their educational programs in the social sciences. They credit discussion leaders who express their own opinions with more influence than they actually have.

Remember, I am talking about *ways and means* of making more farmers acquainted with factual information about economic conditions and issues of the day—not about persuading them to a certain point of view. Strongly opinionated presentation of economic information does not necessarily change the attitudes of the audience. There is ample evidence to show that while some attitudes change, though usually very slowly, information of this kind does not affect attitudes of different people equally, and many not at all.

For example, the AAA fell a long way short of convincing all farmers of the correctness of its approach to agricultural adjustment. The Democrats may gloat about the last election "proving" farmers don't like flexible price support and want rigid crop controls, but they should not forget the previous two elections when the Midwest farm vote was Republican. One could make just as good a case that farmers were *opposed* to crop acreage restrictions.

The point is that the AAA's slanted and opinionated presentation of economic information nevertheless got the facts across to many more farmers than a more objective, and duller, method would have.

The CIO does not convince all its members on its numerous policy positions, but its vigorous manner of presentation does increase the absorption rate of a great many facts about prices, wages, industrial production, and other economic indicators. I would recommend to Extension economists, editors, and administrators that they look over some of the publications of both the CIO and AFL for examples of effective economic education. What

these educators should be worried about is not the great effect of their opinions but the *lack of effect* of their dissemination techniques.

This same principle of taking sides and being *for* or *against* something can be applied to outlook information. Many writers of outlook reports are scared to death that they might be wrong in a forecast. I wouldn't be so worried about being wrong as about not being listened to. If an economist who spends all his time studying the economic situation is afraid to form a judgment, how does he expect his readers to form one, or to pay attention to him? In this connection, let me point to the Doane Agricultural Service as an example of effective outlook information. It is not satisfied to present the facts alone. It gives the facts color and meaning by going the next step and forming a judgment. It probably gets across a good deal more outlook information to farmers than many of our state colleges do.

It isn't necessary to go out looking for a fight in order to bring economic information to farmers. But avoiding controversy can be a way of *not* accomplishing much in this field.

While it is important that educational institutions, as institutions, remain objective, this does not mean individual staff members must never commit themselves.

In fairness to the agricultural colleges, we should recognize that it is not easy for them to conduct economic information work about hot political issues. With loyalty investigations rampant in both state and national governments, it takes some courage to try to do an educational job in social science. It is much easier to just pass by anything that looks like it might create trouble. Still, shying away from these issues by the educational agencies, who are best equipped to discuss them and bring out the relevant facts and information, leaves the field to the charlatans and interest groups.

Getting economic information to farmers is at least as important as any other agricultural program being carried on today. It deserves a great deal more study and imagination on the part of educational institutions, government agencies, and the press.

DISCUSSION

GEORGE A. POND

University of Minnesota

Mr. Morse and Mr. Soth are inclined to accuse farm economists in general and extension economists in particular with being unduly cautious

and conservative in their interpretation of the economic outlook to farmers. It might be an interesting study for some enterprising and imaginative graduate student to analyze the "batting averages" of farm economic prognosticators and their appraisal by farmers.

Director Burch develops one point that the other two speakers fail to mention—namely the importance of having the farmer understand the reasoning behind any economic program or planning to which he is a party.

One can hardly believe that either Mr. Morse or Mr. Soth thinks the farmer will be satisfied or most effectively served by the "dope sheet" type of economic outlook, although that could easily be inferred from their papers. I agree with them that farmers would like to have a definite specific statement of the economist's opinion on prospective prices.

Even if the economist has the right advice for the occasion it may have no bearing on the next economic problem that confronts the farm operator. If he has been taught the process of solution, he can apply it to the new problem and get the answer that does fit.

We should be indebted to Mr. Morse for his emphasis on the increasing proportion of farm inputs that involve cash outlay. This is significant from the standpoint of the vulnerability of farmers in depression periods. However there is still a large proportion of fixed costs in farming that cannot be escaped by curtailing production. I question whether any large number of farmers will cease or severely curtail operation voluntarily in the next depression.

The heavy stress Mr. Morse lays on the part government programs play in determining the price outlook for farmers rather negates the emphasis he places on accurate and specific economic forecasts.

Mr. Soth's major emphasis, as one might logically expect of a journalist, is on publicity methods. His comparison of extension methods in the education field with the sales efforts of AAA workers seems hardly an altogether valid one. I also question the significance of his comparisons between the educational methods of economic extension workers and the success of union labor leaders in rallying workers to their program. Here again monetary rewards and various types of coercion make this distinctly a "horse of a different color." To develop successful pressure groups which sponsor programs that may be distinctly uneconomic or to sell them on the basis of misinformation, even if distinctly successful is hardly comparable with extension teaching.

I am sure Mr. Soth does not mean what he seems to imply in lauding the "spell-binder" and the "rabble rouser" because they are able to influence people to action regardless of whether that action is good, bad, or indifferent. Extension and research economists may at times be colorless and prosaic but that is no reason for them to court popular acclaim by pressing a cause just because it can be made to appeal to certain special interest groups. It is better to sell a little sound economics than, by much sound and fury to stimulate a lot of phony thinking.

DISCUSSION

A. SHULTIS

Extension Service, California

Mr. Morse in his closing paragraph states that able farm managers realize that economists cannot always be right in their forecasts but that their best judgment is wanted. This would imply the willingness and ability of the able farm manager to consider the evidence and draw his own conclusions as to the most profitable farming plan for a particular farm. But there are many people managing farms that are not able and might need help. Mr. Morse tells them through the Doane-Agricultural Digest and according to Mr. Soth more effectively than do we in the Extension Service. We should take some lessons. Certainly farmers need more specific and timely information for planning their operations and their buying and selling. Public agencies such as the U.S.D.A. and Federal-State Crop and Livestock Reporting Services and Market News services are doing a bigger and better job all the time. But more and better distribution should be possible even with existing knowledge, funds and personnel.

Mr. Soth makes a case that merely increasing the supply of this economic information won't get it in the hands of farmers. We need to time it as to interest, put it in understandable, useful form and then use all available methods and channels to get it in the hands of farmers in such a way that they will act on it. He feels we must not avoid controversial issues or taking sides. We gain a hearing only on something of intense interest and even then only with an argument and not a dispassionate exposition of both sides.

Managing a farm for highest total profit or smallest loss over the next few years of uncertain prices, production allotments, continuing high costs and additional new scientific and mechanical developments will require high professional competence in the art of farm management. There are many able farm managers but there are far more that need some training and help. Here is a big job with plenty of room for all agencies—public and private.

There is still plenty of room for private professional assistance to many farmers able and willing to pay for service beyond that which can be obtained free. The Doane Agricultural Service of which Mr. Morse is president, is certainly making a large and important contribution to better farming along with many similar agencies and private consultants. It is surprising there is not more of such service available in the far west.

Perhaps one of the most promising methods of applying the art of farm management to the average family farm is through the Balanced Farming Associations in Missouri and the Farm Management Associations in some of the other middlewestern states. The essence of these plans is the payment by the farmer of part of the cost of a farm planning service beyond that obtainable in free educational programs.

The farm family paying part of the cost of assistance was cited by Director Burch as favoring the full development and use of the farm and home plan. Apparently this cost has not been a deterrent to the growth of the Balanced Farming Associations. Lack of trained personnel has been the main deterrent.

Director Burch raises a significant question about tying in the Agricultural Conservation Program with Balanced Farming Plans. We have doubtless heard the suggestion that A.C.P. payments be made only where there is a sound land use plan. Our first reaction is to shudder at a shotgun wedding of such payments to the art of farm management. Farm plans poorly prepared to qualify for an A.C.P. payment might discredit the whole idea of farm planning. On the other hand A.C.P. practice payment to share the cost of a developed farm plan might be merited. Here is a real opportunity as Director Burch says for a great voluntary program to obtain and pay for soil conservation and obtain crop adjustment through mass farm planning. It will need some help from the farm management field.

As a representative of the far west, I should present an alibi regarding our small progress in individual farm planning. It looks good, but we can't seem to make much headway. In California our commercial farms are fairly large and highly specialized with a rather narrow range of adapted and profitable enterprises. But we see many shifts and readjustments coming which will require intelligent reorganization of many individual farm businesses. We must improve our abilities, material and methods in farm planning.

These three papers all present a convincing case for a larger number of workers better trained in the art of farm management.

INTEGRATING ECONOMIC AND LEGAL THOUGHT ON AGRICULTURAL COOPERATIVES

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THE shift to more government in economic life arises primarily because law in a democracy is not merely a system of authoritative legal materials; it is also a specialized form of social control resulting from organized pressure of economic and political groups in the social order. Probably no better example of political pressure for better bargaining power can be found anywhere than the pressure of American laborers and farmers to gain the legal right to organize for group welfare.

Time permits only a limited consideration of details. What I shall chiefly endeavor to present to you is an outline of the persistent, powerful, and slow moving group forces in their economic and legal aspects, from which is now emerging the modern cooperative corporate associations of farmers in this country.

Common Law and Free Competition

History is replete with the struggles of men to find freedom and economic justice within the legal framework of different social orders.¹ Out from the volumes comes one clear lesson: that while a country is not populated appreciably beyond its optimum relation between numbers and consumable resources, a capitalistic-democratic form of government has insured the largest number the surest political freedom, the strongest financial incentive, the widest economic opportunity, and the greatest individual power to command goods and services.

On the other hand, the very freedoms inherent in a dynamic modern capitalistic democracy have also produced the most and largest private-profit corporations with the greatest concentration of economic power.

As Pericles emphasized, it is a biological rule of life that big fishes live on little fishes. Similarly the freedoms which allowed big corporations to be controlled by a few citizens provided, and to a con-

¹ Toynbee, Arnold Joseph, *The Study of History, Abridgment of Vols. I-VI* by D. C. Summerville, Oxford University Press, 1946.

siderable degree still provide, an easy method for the exploitation of unorganized farmer and consumer groups.²

The legal controls which the common law exercised at about the beginning of the nineteenth century to insure a free and fair exchange of goods and services were relatively simple and unusually effective. Both criminal and civil law made illegal all combinations in restraint of trade, except, that partnerships, joint stock associations and a few monopolistic Royal Charter corporations were allowed.³

The laissez-faire economy, following the time of Adam Smith (1723-1790) and David Ricardo (1772-1823), was grounded on the legal principle that the function of government was to preserve free competition between individuals and small unincorporated associations. Except as the law allowed partnerships, joint stock associations and licensed monopolies, it was the duty of the State to destroy every attempt to profit by combinations restraining trade or enhancing prices in any degree.⁴ It was generally believed that if free competition could thus be preserved, business efficiency and

² Nourse, Edwin G., *From Dogma to Science in Cooperative Thinking*, American Cooperation, American Institute of Cooperation, Washington, D. C., 1946, pp. 10-11.

See also: Berle Jr., Adolf A., and Means, Gardner C., *The Modern Corporation and Private Property*. The Macmillan Co., N. Y. 1933.

The classical statement on exploitation of farmers by parties more strategically situated was quoted by the United States Supreme Court in the case of *Liberty Warehouse Co. v. Burley Tobacco Growers Co-operative Marketing Ass'n.* (276 U.S. 71, 1928) from the Kentucky Supreme Court as follows:

"We take judicial knowledge of the history of the country and of current events and from that source we know that conditions at the time of the enactment of the Bingham Act were such that the agricultural producer was at the mercy of speculators and others who fixed the price of the selling producer and the purchasing price of the final consumer through combinations and other arrangements, whether valid or invalid, and that by reason thereof the former obtained a grossly inadequate price for his products. So much so was that the case that the intermediate handler between the producer and the final consumer injuriously operated upon both classes and fattened and flourished at their expense. It was and is also a well known fact that without the agricultural producer society could not exist and the oppression brought about in the manner indicated was driving him from his farm, thereby creating a condition fully justifying an exception in his case from any provision of the common law, and likewise justifying legislative action in the exercise of its police power." (208 Ky. 649, 271 S.W. 695.)

³ See: Oppenheim, S. Chesterfield, *Cases on Trade Regulation*, West Pub. Co., 1936, p. 8. For a brief history of Royal Charter corporations which were chartered monopolies in foreign trading, such as the Hudson Bay Fur Company and East India Company, see: Williston, Samuel, *History of the Law of Private Corporations Before 1800*, 2 Har. L. Rev. 109.

⁴ Oppenheim supra note 3 quotes from Blackstone and Coke: "In England the original and narrow meaning of 'monopoly' was 'a license or privilege allowed by the King for the sole buying and selling, making, working or using of anything whatsoever, whereby the subject in general is restrained from the liberty of manufacturing or trading which he had before.' Also associated with the problem of monopoly were the early common law offenses of engrossing, forestalling and regrating."

fair prices would result and thus the general welfare would be insured. The economic results in a large measure justified the belief in competitive individualism as an efficient regulator of industrial and commercial life.

Thus, if two or more partnerships, joint stock associations, laborers or farmers contracted or combined to gain a financial advantage in the market they were guilty of an illegal conspiracy in restraint of trade and could be prosecuted criminally⁵ at the option of the State or enjoined in a civil action in a court of equity at the option of an interested citizen.⁶

As late as 1913, the Supreme Court of Iowa invoked the common law doctrine of illegal conspiracy against the Decorah Farmers Cooperative Society because a local group of farmers had voluntarily associated together to jointly demand a slightly higher and fairer price than Mr. Reeves, the Chicago buyer, was willing to pay for their hogs.

The court did not analyze whether its own duty was to equalize as far as possible the bargaining power of the farmers against that of the big packing company of Chicago whom Mr. Reeves represented. It enforced the traditional, but now economically outmoded, common-law doctrine that free competition between individual sellers and buyers must be upheld, even if the latter possessed the advantage of quasi-monopolistic bargaining power.

A permanent injunction was decreed against the enterprising Decorah hog raisers. The court thus dissolved the cooperative society and relegated the farmers once again to the disadvantageous position of competitive individual selling of their livestock at wholesale prices, while at the same time they were compelled to pay retail prices for the things they purchased.

It is pleasing to note that this bad decision is one of the last in this country to deny to farmers the right to organize a cooperative through which to jointly market their products.

Industrial and Legal Inventions Concur

Limits of time preclude even a highlight tracing of the concurrent growth of industrial inventions and assembly line techniques on

⁵ Rex v. Bykerdike, Lancaster Assizes, 1832, 1 Moo. & R. 179; People v. Fisher 14 Wendell 9, N.Y. (1835). In the latter case the New York court reaffirmed the principle that it was a criminal conspiracy to combine and strike for a raise in wages; and State v. Donaldson 32 N.J. Law 151, 90 Am. Dec. 649 (1867).

⁶ Reeves v. Decorah Farmers' Co-operative Society, 105 Iowa 194, 140 N.W. 844 (1913).

the one hand, and of their legal counterparts: parent and subsidiary corporations,⁷ holding companies,⁸ voting trusts,⁹ affiliated corporations by use of interlocking directorates and non-par stock.¹⁰

Suffice to say that all anti-trust attempts to restrict the growth of big corporations and corporate combinations, met with little success except in the relatively limited field of Public Utility Regulation.¹¹ Here by the use of rate making powers a fair profit was usually defined as, and enforced at, approximately six percent on invested capital.

During the last half of the nineteenth century private-profit corporations of all kinds grew and flourished—through stock acquisitions, consolidations and mergers. Their perpetual life, limited liability for members, centralized management and capacity to command the best professional skills, all made for rapid and extensive accumulations of capital, and of surplus profits. For a time their indirect benefits of efficient production appeared to outweigh the evils of their great quasi-monopolistic power. About 1880 many courts, and the business and financial interests generally began to praise big corporations more than they condemned them.¹² Mechanization and corporate efficiency did supply an increasing flow of goods and services, usually at reduced prices.

By 1890, however, labor and agriculture generally realized that their bargaining ability to extract their just economic due from the total annual goods and services was feeble when compared with the bargaining power of capitalistic corporate groups inherent in the pricing power of big corporations.

Nevertheless Congress was not yet ready to increase the bargaining power of labor and agriculturists by allowing them to combine for group welfare. Congress resolved upon one last vigor-

⁷ Latty, Elvin R., *Subsidiaries and Affiliated Corporations*, Foundation Press, Brooklyn, N.Y. (1936).

⁸ Crole and Means, *The Modern Corporation and Private Property*, The Macmillan Co., N.Y. (1933) pp. 91, 203–206, 212, 319.

⁹ Cushing, Henry A., *Voting Trusts*, The Macmillan Co. (1927).

¹⁰ Ballentine, Henry, *Non Par Stock—Its Use and Abuse*, 57 Am. L. Rev. 233 (1928).

¹¹ Public Utility regulation by the states gained impetus by the enactment of the Interstate Commerce Commission Act of 1887, 43 Stat. 801, 49 U.S.C.A. Sec. 1 et seq.

¹² Justice Field in writing the decision of the Court in the Railroad Tax case of San Mateo County v. Southern Pacific Railroad (Cir. Ct. D. Calif.) 13 Fed. 722, 743 (13 Fed. 722, 743 (1882)) sang the praises of the corporations, as follows: "As a matter of fact, nearly all enterprises in this state, requiring for their execution an expenditure of large capital, are undertaken by corporations."

ous effort to curb big profit-corporations and to try to make them compete with each other in the public interest. This economic judgment and objective was implemented by the enactment of the Sherman Anti-Trust Act of 1890.¹³

There were, however, courageous legal-economic scholars on supreme courts in many places who thought the Sherman Anti-Trust Act was inadequate. They saw more clearly the difficulties of curbing the growth or activities of business corporations. They declared a new duty for both legislatures and courts: namely, to help equalize bargaining power of competing economic classes by making and enforcing laws to strengthen labor and agriculturists against the enhanced economic power of big business corporations.

For a few decades these thinkers were the dissenters, but slowly their economic views gained wider acceptance.

Justice Oliver Wendell Holmes was the greatest dissenter of them all. With broad vision, wise understanding and resolute courage he led the vanguard of a newly forming economic-legal thought. In the Vegelahn labor case of 1896,¹⁴ in which the majority of the court denied a right of peaceful picketing, Justice Holmes wrote one of his most classical dissents, as follows:

It is plain from the slightest consideration of practical affairs, or the most superficial reading of industrial history, that free competition means combination, and that the organization of the world now going on so fast means an ever increasing might and scope of combination. It seems to me futile to set our faces against this tendency. Whether beneficial on the whole, as I think it, or detrimental, it is inevitable, unless the fundamental axioms of society, and even the fundamental conditions of life, are to be changed.

One of the eternal conflicts out of which life is made up is, that between the effort of every man to get the most he can for his services, and that of society, disguised under the name of capital, to get his services for the least possible return. Combination on the one side is patent and powerful. Combination on the other hand is the necessary and desirable counterpart, if the battle is to be carried on in a fair and equal way.

The economic argument of Justice Holmes was just as applicable to a right for farmers to combine to get a fair price for their products as it was for labor to combine to get a fair wage for its services.

Following the enactment of the Sherman Act in 1890 many states passed anti-trust laws. Some even placed anti-trust provisions in

¹³ 26 Stat. 209 (1890), 15 U.S.C.A. Sec. 1 et. seq. (1940).

¹⁴ Vegelahn v. Gunter 167 Mass. 92, 44 N.E. 1077 (1896).

The principle of this dissent was upheld in 1921 by the United States Supreme Court, Chief Justice Taft writing the decision in the case of American Steel Foundries v. Tri-City Central Trades Council 257 U.S. 184, (1921).

their amended constitutions in an endeavor to check the concentration of capital and the growth of corporate powers.

Illinois passed an anti-trust statute in 1893 which declared criminal and void any combination of two or more persons, firms, corporations, or association of persons, to restrict trade, to affect the price of a commodity, or to prevent competition on an individual basis in the manufacture, transportation, sale or purchase of merchandise, products or commodities, except "that this act shall not apply to agricultural products or livestock while in the hands of the producer or raiser."¹⁶

In 1902 the Supreme Court of the United States held the Illinois antitrust statute unconstitutional and void in the Connelly Case¹⁶ on the ground that it favored farmers and thus violated the equal protection clause of the 14th Amendment. The court, with only Mr. Justice McKenna dissenting, said that the separate classification of agriculturists was arbitrary and capricious, since all persons mentioned in the statute fell within the same general class: persons engaged in domestic trade.

The dissent of Mr. Justice McKenna upheld the Illinois legal classification as fully warranted by the difference between farmers and city merchant men.¹⁷ His discerning dissent, as we shall see, became the opinion of the Supreme Court in 1940 in *Tignor v. Texas*.¹⁸

Reasonable Enhancement of Price Allowed After 1911

The Supreme Court of the United States diligently endeavored for about fifteen years to enforce the Sherman Anti-Trust Act in the spirit in which Congress wrote it, namely, that "every contract, combination in the form of trust or otherwise, or conspiracy, in

¹⁶ See: *Connolly v. Union Sewer Pipe Company* 184 U.S. 540, 554 (1902).

¹⁶ *Ibid.* The 14th amendment declares in part that: "No state shall deny to any person within its jurisdiction the equal protection of the laws."

¹⁷ Mr. Justice McKenna aptly observed in his dissent in the Connolly Case as follows: "The excluded class is composed of farmers and stock raisers while holding the product or livestock produced by them. The included class is composed of merchants, traders, manufacturers, all engaged in commercial transactions. That is, one class is composed by persons who are scattered on farms; the other class is composed of persons congregated in cities and towns, not only of natural persons but of corporate organizations. In the difference of these situations, and in other differences which might occur to any reflection, might not the legislature see differences in the opportunities and powers between the classes in regard to the prohibited acts?"

¹⁸ *Tignor v. Texas*, 310 U.S. 141 (1940).

restraint of trade or commerce among the several states"¹⁹ was a misdemeanor and also illegal by civil law. This codification of the common law against monopoly and engrossing²⁰ was for the chief purpose of preventing an "enhancement of price" by reason of contract or combination of the corporation concerned.

By 1911, however, almost the entire membership of the Supreme Court decided that the common law doctrine that all restraints of trade were illegal just could not be legally enforced in a corporately organized economy. The court's only alternative was to make a new legal doctrine compatible with the admitted existence of expanding corporate combinations. The new doctrine allowed the courts to try to curb selfish corporate actions for excessive economic gains of the control group and the investors, while it required the court to determine that some corporate combinations did not enhance, or attempt to enhance, price unduly. The United States courts must now distinguish between good and bad corporate combinations. This inevitable decision was fraught with unknown risks and hazards for it was a venture into uncharted legal-economic seas.

In 1911 the United States Supreme Court announced "the rule of reason" in the Standard Oil Company²¹ and the American Tobacco Company²² cases with only Justice Harlan dissenting. Henceforth not all combinations restraining trade would be held illegal but only those which unduly or unreasonably enhanced or attempted to enhance the price of commodities or products. We shall trace this idea into the spirit and language of the Capper-Volstead Act²³ passed eleven years after these decisions.

¹⁹ See note 18. In Northern Securities Co. v. United States 193 U.S. 197 (1904) the Court observed: "A partnership is not a contract or combination in restraint of trade between the partners unless the well known words are to be given a new meaning invented for the purpose of the Act."

²⁰ Standard Oil Company v. United States 221 U.S. 1, 4, (1911).

²¹ *Ibid.* The court, Mr. Chief Justice White writing the opinion in the Standard Oil Company case said,

"To treat as condemned by the Act all agreements under which, as a result, the cost of conducting an interstate commercial business may be increased would enlarge the application of the act far beyond the fair meaning of the language used. There must be some direct and immediate effect upon interstate commerce in order to come within the act

If the criterion by which it is to be determined in all cases whether every contract, combination, etc., is a restraint upon trade within the intendment of the law, is the direct or indirect effects of the acts involved, then of course the *rule of reason* must be the guide."

²² United States v. American Tobacco Company 221 U.S. 106 (1911).

²³ 42 Stat. 388 (1922), 7 U.S.C.A. Secs. 291-292 (1940).

Section 6 of the Clayton Act

The establishment of the rule of reason had opened Pandora's Box of political pressures for economic group advantage. Within three years after the Supreme Court announced the "rule of reason" the classical dissent of Justice Holmes in the Vegelahn case, *supra*, became Congressional policy with the enactment of Section 6 of the Clayton Act²⁴ of 1914, both as to labor and farmers. The right of these economic classes to organize for mutual self help was for the first time recognized by Congress. Thus in 1914, it became legal for laborers and farmers to impose at least reasonable organizational restraints upon interstate commerce for the purposes, respectively of securing higher wages, and higher prices for agricultural commodities and increasing their bargaining power in a predominantly corporate economy.

Section 6 of the Clayton Act was construed favorably by the Federal District Court for Oregon in *United States v. Dairy Cooperative Association*²⁵ in 1943. In quashing the indictment for alleged criminal conspiracy to enhance the price of milk Judge McCollough wrote:

I am told this is the first case brought by the Anti-Trust Division of the Department of Justice against a farmer's cooperative acting alone and not in concert with others. . . . I am asked to scuttle the plain language of the Clayton Act as to cooperatives, as the anti-labor courts scuttled the labor provisions of the same act. When Congress said that cooperatives were not to be punished even if they became monopolistic it would be ill-considered for me to hold to the contrary.

The Capper-Volstead Act of 1922

While the Clayton Act, *supra*, authorized the organization of non-profit, *non-stock* cooperative corporations, the right of agriculturists to organize cooperative corporations was given much broader sanction by the enactment of the Capper-Volstead Act²⁶ in 1922.

²⁴ 38 Stat. 730 (1914), as amended 15 U.S.C.A. Secs. 12-27. Section 6 of the Clayton Act reads: "The labor of a human being is not a commodity or article of commerce. Nothing contained in the antitrust laws shall be construed to forbid the existence and operation of labor, agricultural or horticultural organizations, instituted for the purpose of mutual help, and not having capital stock or conducted for profit, or to forbid or restrain individual members of such organizations from lawfully carrying out the legitimate objects thereof; nor shall such organization or the members thereof, be held or construed to be illegal combinations or conspiracies in restraint of trade under the anti-trust Laws."

²⁵ *United States v. Dairy Cooperative Association*, 49 Fed. Supp. 475 (D. Ore. (1943)).

²⁶ 42 Stat. 388 (1922), 7 U.S.C.A. Secs. 291-292 (1940).

By this Act Congress granted the legal right to agriculturists to organize stock as well as non-stock cooperative corporations. So long as the organization and operation of an agricultural cooperative marketing corporation did not "unduly enhance the price" of the products marketed, it was exempt from the provisions of the Sherman Anti-Trust Act.

The Capper-Volstead Act also inaugurated the principle of the determination of a fair price for agricultural commodities which expanded enormously under the Office of Price Administration during the second World War, for it gave the Secretary of Agriculture the right and duty of determining when the price of an agricultural product had been "unduly enhanced," that is, enhanced above a fair price, by reason of cooperative corporate organization or operation, or both. This difficult economic task has not often been exercised by the Secretary of Agriculture.

The Capper-Volstead Act also contains the beginnings of a legislative definition of a true cooperative.

In order for a cooperative to gain limited anti-trust immunity under the Sherman Anti-Trust Act, interpreted by the "rule of reason," four requirements are set out. The requirements for qualification as a Capper-Volstead cooperative are:

First, The cooperative corporation must be organized only by agriculturists.

Second, Each association must be operated for the mutual benefit of the members thereof as producers except as to parent subsidiary cooperatives which are allowed under the Act.

Third, The association shall not deal in the products of non-members to an amount greater in value than those handled by it for members.

Fourth, The association must conform to one or both of the following:

- a. One member, one vote, irrespective of capital owned, or
- b. Dividends on stock or membership capital shall not exceed eight percent.²⁷

The Capper-Volstead Act is truly the Magna Charta of cooperative agriculture.²⁸

Three of the above incidents of an agricultural cooperative are found in the rules of the early Rochdale Equitable Purchasing Cooperative of England where in about 1844, twenty-eight friends and fellow craftsmen formed a new type of unincorporated, non-profit, joint stock association to purchase necessities at a saving

²⁷ Note 28.

²⁸ See: Jensen, A. Ladru, *The Bill of Rights of U.S. Cooperative Agriculture*, 20 *Rocky Mountain Law Review*, 181-189 (Feb. 1948).

over what they were required to pay in the ordinary retail market.

Mr. Edwin G. Nourse states the essence of the Rochdale dogma thus:

If you require every member to buy a share of capital stock and limit the amount any one member may hold, if you give each member only one vote, if you put a low ceiling on interest paid to purchasers, follow market prices, sell for cash, and return any residue in proportion to patronage, you have a cooperative.²⁹

We shall examine further statements as to the essentials of a co-operative after first observing how the Capper-Volstead Act has fared in the United States Supreme Court.

Six years after its enactment the Act received favorable recognition by the Supreme Court in the case of *Liberty Warehouse Co. v. Burley Tobacco Growers' Co-op. Marketing Association*.³⁰ In a unanimous decision the court said:

It is stated without contradiction that cooperative marketing statutes substantially like the one under review (Ky. Bingham Act, 1922) have been enacted by forty-two states. Congress has recognized the utility of cooperative associations among farmers in the Clayton Act, 38 Stat. 730; the Capper-Volstead Act, 42 Stat. 388; and the Cooperative Marketing Act of 1926, 44 Sts. 802. These statutes reveal widespread legislative approval of the plan for protecting scattered producers and advancing the public interest. Although frequently challenged, we do not find that any court has condemned a single feature of the plan with the single exception of the Supreme Court of Minnesota.³¹

Although the Liberty Warehouse case indicated that agricultural cooperatives were held in high favor by the court, nevertheless the case did not overrule the Connelly Case, *supra*, which held invalid the exemption of cooperatives from the Illinois Anti-Trust Law, but side-stepped it. The Warehouse Company, with all other persons was forbidden to induce a member of the cooperative to refuse to

²⁹ Nourse, Edwin G., *From Dogma to Science in Cooperative Thinking*, American Cooperation, American Institute of Cooperation, Washington, D.C. (1946) p. 9.

³⁰ *Liberty Warehouse Co. v. Burley Tobacco Growers' Cooperative Marketing Association*, 276 U.S. 71 (1928).

³¹ *Ibid.* In addition to the statutes above cited a partial list of federal statutes supporting cooperatives are: The War Finance Corporation Act of 1918; The Packers and Stockyards Act of 1921, 42 Stat. 159, 7 U.S.C.A. 181; The Grain Futures Act of 1922, 12 Stat. 998, see *Board of Trade v. Olsen*, 262 U.S. 1; Federal Intermediate Credit Bank Act of 1923, 42 Stat. 1454, 12 U.S.C.A. 1021; Agricultural Marketing Act of 1929, 46 Stat. 11, 12 U.S.C.A. 1141; Farm Credit Act of 1933 authorizing the banks for cooperatives, 48 Stat. 257, 12 U.S.C.A. 1134, Robinson Patman Act of 1936, 49 Stat. 1526, 15 U.S.C.A. 13; The Rural Electrification Act of 1936, 49 Stat. 1363, 7 U.S.C.A. 901 and the Commodities Exchange Act of 1936, 49 Stat. 1491, 7 U.S.C.A. 451.

perform his marketing contract upon a statutory penalty of \$500 for so doing. The court said, "There is no basis on which to invoke the equal protection clause on which the Connelly Case was decided." So the question was left open for a later decision.

In 1940 Justice Frankfurter wrote the opinion of the Supreme Court in the case of *Texas v. Tignor*.³¹ The Texas Anti-Trust statute had general application except that it did not apply "to agricultural products or livestock in the hands of the producer or raiser." The Court overruled the old Connelly case, *supra*, of 1902 and held that the Texas statute was not violative of the equal protection clause of the 14th Amendment but was reasonable classification.

The Court in adopting the reasoning of the dissent of Justice McKenna in the Connelly Case, *supra*, said:

Since Connelly's Case was decided nearly forty years ago, an impressive legislative movement bears witness to general acceptance of the view that the difference between agriculture and industry calls for differentiation in the formulation of public policy. The states as well as the United States have sanctioned cooperative action by farmers; have restricted their amenability to anti-trust laws; have relaxed their organizations from taxation.

Congress and the states have sometimes thought it necessary to control the supply and price of agricultural commodities within their respective spheres of jurisdiction and the constitutional validity of these measures has been sustained. . . .³²

These various measures are manifestations of the fact that in our national economy agriculture expresses functions and forces different from the other elements in the total economic process. . . . The Fourteenth Amendment . . . does not require things which are different in fact or opinion to be treated in law as though they were the same. And so we conclude that to write into law the differences between agriculture and other economic pursuits was within the power of the Texas legislature.

The legal right of agriculturists to organize large parent-subsidiary, federated cooperative corporations to help enhance the price of their products to a fair price³³ is now firmly established. This does not mean however that agricultural cooperative corporations may contract or combine with other persons, natural or corporate, to enhance the price of agricultural products marketed by the cooperative even if the price by so doing would not be unduly enhanced.

³¹ Note 18.

³² *Ibid.*, see: *Milford v. Smith* 307 U.S. 38, 83 L ed 1092, 59 S Ct 648; *United States v. Rock Royal Cooperative*, 307 U.S. 533, 83 L ed 1446, 59 S Ct 993, *Nebbea v. New York* 291 U.S. 502, 78 L ed 940, 54 S Ct 505, 89 ALR 1469.

The contract or combination with a third party to stabilize, enhance or affect prices, was held to be violative of the Sherman Anti-Trust Act in *United States v. Borden Company*.³⁴

The Court held that when the Pure Milk Association, a lawful cooperative under the Capper-Volstead Act, combined with a drivers' union, a Chicago milk distributor, and the Chicago Municipal authorities to control the Chicago milk market, such attempt irregardless of whether the present price was fair or not was an illegal conspiracy under the Sherman Anti-Trust Act, and the Capper-Volstead Act was no protection to the Pure Milk Cooperative Association which had become one of the parties to the illegal combination.

Bargaining Power and Income Tax Exemption

By a provision in the Federal Income Tax Act of 1926³⁵ continued to the present time, agricultural cooperative associations whether incorporated or not may qualify for so-called tax exempt status if they meet eight specific legal requirements which we shall examine shortly.

The phrase "so-called tax exemption" is used to call attention to the confusion existing in the minds of many people who erroneously believe that patronage refunds, paid to members by reason of a contract obligation to do so existing prior to the receipt of income, are deductible from cooperative income in determining Federal income tax, if any. The cooperatives are not exempt from taxes on these funds. Patronage refunds are not deductible, but are excludable from the gross income of the cooperative agent and includable in the gross income of the principal, patron member. The only income that is legally exempt in a true cooperative is amounts used to pay dividends on capital and possibly some limited reserves in some cases.³⁶ Whether a cooperative gains exemption on amounts paid out as dividends and in some cases on some accumulated reserves, or operates as an agent at cost and avoids accumulation of taxable income by remitting, under prior contract obligation, all profits to its patrons as principals—in

³⁴ *United States v. Borden Company* 308 U.S. 188 (1939) reversing 28 F. Suppl 177. For detailed analyses of this case see Hanna John, *Anti-Trust Immunities of Cooperatives, Law and Contemporary Problems*, Duke University School of Law Vol. 18, Summer 1948, pp. 488-504.

³⁵ 48 Stat. 608 (1926), 26 U.S.C.A. 101 (12) (1940).

³⁶ *Commissioner of Internal Revenue v. American Box Shook Export Co.*, 1946, 156 Fed. 2d 629.

either or both events the economic return and bargaining power to the individual cooperators is enhanced.³⁷

We have already made reference to the Rochdale tests of a true purchasing cooperative. We have also summarized the statutory requirements of an agricultural marketing cooperative under the Capper-Volstead Act, *supra*. With the exceptions of the basic partnership idea of one man, one vote, and of a too-high dividend allowance in view of our experience with low interest rates following the great depression of the 1930's, the statutory definition found in the Internal Revenue Code, Section 101 (12) of a so-called tax exempt cooperative appears to be probably the best definition of a "pure" or true cooperative yet evolved.

Frank Robotka recently called for new thought patterns on cooperatives and offered his analysis of "An economic concept of a 'pure' cooperative" in part as follows:

Every true cooperative represents an effort on the part of two or more autonomous units jointly to conduct, coordinately with each other, given operations essential to the economic activity of member units. It is the avowed purpose of true cooperators not to interpose a business enterprise in the usual sense between themselves and their market. In a technical economic sense, this can mean only that it is their purpose to function in their own capacities as sovereign units, that is, to perform designated functions or services as integrated with their individual economic pursuits.

The cooperative organization consists of the sum of the relationships and arrangements established among member units in order to effectuate their purpose. In an economic sense, these arrangements are designed to enable member units jointly to participate in the performance of their entrepreneurial functions with respect to the given activities which they desire to conduct in coordination with each other.

An integrated operation does not constitute an independent profit-making unit, that is, a "firm." Such an operation is a branch or a department of the integrating unit or, as is the case in a cooperative, of a group of integrating units.³⁸

Although Dr. Robotka's economic language is strange to the lawyer, the legislators and the courts, the concepts have their clearly recognizable counterparts in statutory provisions and

³⁷ An excellent and most comprehensive article dealing with taxes and bargaining power is: Paul, Randolph E. (Tax advisor to U.S. Treasurer, 1942-44), *Justifiability of the Policy of Exempting Farmers' Marketing and Purchasing Cooperative Organizations from Federal Income Taxes*, 29 Minn. Law Rev. 343-375 (May 1945). See also, *Tax Liability of Cooperatives*, Commerce and Industry Association of New York, Inc., New York, N.Y. 1946.

³⁸ Robotka, Frank, *Lego-Economic Implications in Cooperation*, American Co-operation, American Institute of Cooperation, Washington, D.C. (1946), pp. 522-533.

court decisions, including some judicially defined cooperative terminology.³⁹

The eight statutory requirements for a cooperative to gain tax exempt status under Internal Revenue Code 101 (12) are:

1. The association must be organized by farmers on a cooperative basis.
2. It must operate, as a marketing or purchasing agency or both, on a cost basis, ultimately turning back all net proceeds to member and non-member patrons on a basis either of quantity or the value of the products furnished.
3. Substantially all stock except non-voting, non-profit-sharing preferred stock must be owned by producers or purchaser-member patrons.
4. Dividends may not exceed eight percent or the legal rate in the state of incorporation, whichever is greater.
5. Only reserves required by state law, or reasonable reserves for any necessary purpose may be accumulated.
6. Neither the cooperative nor its member patrons may gain a discriminatory advantage on non-member business.
7. Non-member business must not exceed member business.
8. Agricultural cooperatives are limited in their purchases for non-member non-producer patrons to 15 percent of total business. Business done with the U.S. or its agencies is to be excluded in determining the right to exempt status.⁴⁰

My comment on the difference in definition of a cooperative by the economist and by Congress is that the former may be in part theoretical while the language of the legislatures and the courts is the final word; the ultimate in social control.

In integrating economic and legal thinking on Cooperative Corporations more exchange of points of view is imperative. It would be extremely helpful to have every school or department of economics place in its library a comprehensive legal dictionary; if possible, the 45 volumes called "Words and Phrases"⁴¹ which gives the judicially construed definitions of all lego-economic terms that have been defined by supreme courts of this country and England, and induce the students and professors to make extensive use of such materials.

Consumers and Cooperatives

The evolution of cooperative associations has been sketched as a struggle of farmers for increased bargaining power and the adapta-

³⁹ Jensen, A. Ladru, Terminology in Cooperative Corporation Law, Proceedings Section of Corporation, Banking and Mercantile Law, American Bar Association 1948, The Business Lawyer, Nov. 1, 1948, pp. 226-236.

⁴⁰ Note 35.

⁴¹ Words and Phrases, West Publishing Company, St. Paul, Minn. 1940.

tion of the non-profit corporation to off-the-farm marketing and purchasing operations.

The farmer must continue to work on his farm. He however, wants his off-the-farm operations to be carried on with as much efficiency as corporate organization, capital, and specialized skills can give, compatible with his retention of ultimate control in selecting directors, and of statutory partnerships organization for the limited purpose of receiving all pro rata net income above cost of operation of his non-profit corporate agent or trustee or both.⁴²

We have not mentioned that consumers, as such, remain largely unorganized in our dominantly corporate economy. One of the public relations tasks of cooperatives is to get the facts to consumers that marketing cooperatives can and do process and distribute food cheaper than was done, or can be done, by profit middlemen whom the cooperatives have replaced in part and are replacing.

Economic research supports this thesis⁴³ and a number of courts have taken judicial notice of this fact in various cases.

The Supreme Court of Wisconsin in the case of Northern Wisconsin Co-op. Tobacco Pool v. Bekkedal⁴⁴ wrote:

The reasons for promoting such (cooperative) legislation are generally understood. It sprang from a general, if not well-nigh universal, belief that the present system of marketing is expensive and wasteful, and results in an unconscionable spread between what is paid the producer and that charged the consumer. It was for the purpose of encouraging efforts to bring about more direct marketing methods, thus benefiting both producer and consumer, and thereby promoting the general interest and the public welfare that the legislation was enacted.

It is small wonder that the courts almost unanimously declare cooperative corporations to be in the public interest when by some enhancement of price to the sellers they still establish greater efficiency in processing and marketing operations and get consumer goods to the purchasers at reduced prices.

Cooperatives v. Middlemen

It is reliably reported as an economic fact that about thirty-five years ago middlemen handled practically all grain that went through the Minneapolis-St. Paul market, and that today the

⁴² Bogardus v. Santa Ana Walnut Growers Assn. 41 Cal. App. 2d 939, 108 p. 2d 52 (1940).

⁴³ Bakken and Schaars, *Economics of Cooperative Marketing*, McGraw-Hill Book Company, 1937, pp. 199-200.

⁴⁴ Northern Wisconsin Cooperative Tobacco Pool v. Bekkedal, 182 Wis. 571, 197 N.W. 936, (1923).

farmers cooperative marketing corporations handle more than 20 percent of the grain which goes through that market, and with a substantial, exemplary savings to the farmer-cooperators.

This economic conflict between cooperatives and the middlemen whom they replace impinges at present in the concerted effort of middlemen dealing in agricultural products and production supplies to enlist all non-cooperative business in a campaign for legislation to tax patronage refunds of cooperatives.

The real problem in this regard is not the competition between the corporately associated farmers, and the middlemen dealers in farm products and production supplies, who directly compete with each other. Competition, if allowed to continue and if cooperatives steadily become more efficient, will eventually solve this problem in the good old American way.

The present problem of farm economists, cooperative corporation lawyers and other cooperative leadership is: how to marshall and disseminate most effectively the economic truth that cooperative corporations cannot and will not replace the bulk of non-cooperative, non-agricultural business if it remains efficient and operates in the public interest. The uninformed fear of non-cooperative businessmen who do not deal in agricultural products or supplies must be replaced with the quieting truth that a strongly organized cooperative agriculture will be a bulwark to a more freely competitive capitalistic democracy, and an anchor against the winds of "Statism."

The economic truth that non-cooperative corporate business can preserve its competitive position in most non-agricultural fields is borne out by the history of cooperative corporate growth in Switzerland and the Scandinavian countries. After fifty years of experience among the realistic Swedes private-profit corporations and non-profit cooperative corporations have found where each can best serve the public. Today they live happily side by side. Last year they teamed together to fight both nationalization and the Communists in the Swedish Riksdag.⁴⁵

Our problem is not only a better integration of economic and legal thought. It is a psychological and public relations one as well. The businessman who does not compete with agricultural cooperatives is one of the publics of the cooperatives. Good public relations

⁴⁵ Wallace, Ralph, Sweden—Land of Light, Reader's Digest, Aug. 1949, pp. 112-116.

require that this group of businessmen be educated to the truth of the finding by the National Association of Manufacturers: that cooperatives are "a legitimate form of private enterprise."⁴⁶

Bargaining Power of Industrialists, Laborers and Farmers

We have sketched the rise of bargaining power of labor unions and of farmers' cooperatives after gaining their legal right to organize for mutual self help by the Clayton Act of 1914. Since that time the bargaining power of labor, through broader and firmer organization, has grown much more rapidly and to a much greater degree than has the bargaining power of agriculturists.

Two and a half years after World War II, the average price of all agricultural products have fallen from their war time highs by about 30 percent, while the wages of organized labor have not fallen at all. This shows an unhealthy disparity between agriculture and labor. Neither have cooperatives yet grown strong enough to aid much in preventing harmful agricultural surpluses.

The pendulum of bargaining power has swung much further toward labor than it has toward agriculturists. Large corporations are still able to raise prices to absorb increasing costs and return a handsome profit. Truly "the rule of reason" and the Clayton Act opened Pandora's box of political pressurers and we struggle for a solution of momentous new problems.

Our economy has passed from the era of free individual competition when the simple common law outlawed all conspiracies in restraint of trade, to a legislative-judicial attempt to establish a workable allocation of bargaining power to non-cooperative corporate groups, labor unions, and farmers. The problem is tremendously big and complex.

The solution must be found in the integration of politics, economics, law, education and public relations with a spiritual aim toward the public interest in the minds and hearts of the leadership of every segment of the American economy. Otherwise, we will lose our heritage of freedoms, because of ignorance, selfishness, and a lack of diligence and cooperation among pressure groups of our society.

⁴⁶ NAM and Cooperatives, National Association of Manufacturers, New York, N.Y., 1946, p. 7.

INTEGRATING ECONOMIC AND LEGAL THOUGHT RELATING TO AGRICULTURAL COOPERATION

HAROLD HEDGES

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A SEARCH of economic literature reveals that substantial attention has been directed to the inter-dependence of economics and the law. But our attention here is to be directed to a limited phase of economic activity—agricultural cooperation—and the legal considerations related to it. It is a subject to which considerable thought has been given in the past. Even so, the same anomalous situation remains today, though in less degree, than prevailed in 1927 when H. G. Moulton wrote in his preface to E. G. Nourse's book, "The Legal Status of Agricultural Cooperation," that, "The economist has been too little aware of the legal requirements and the lawyer too little versed in the fundamentals of economics and business for either to get an adequate grasp of the issues involved in the organization and operation of cooperatives."¹ Dr. Nourse's analysis of legal and economic inter-relationships in the field of agricultural cooperation, as presented in this book, is the most comprehensive of any to date on the subject.

In my opinion, the position Dr. Moulton expresses is a moderate one. In the not too distant past I had occasion to sit in a meeting of attorneys and accountants at which an economist discussed this matter of relationships between economics, law, and accountancy, and presented some quite advanced theory on the economic role of cooperatives. Judging from the discussion which followed, and from comments of listeners after the meeting, I was convinced there was actual resistance to the "radical" views of the economist. I trust that this is an isolated case not representative of the attitudes of lawyers and accountants generally. It is possible, of course, that more mature contemplation of the new ideas may have put them in a more charitable mood.

L. S. Hulbert² and other legal authorities have given us quite thorough and up-to-date analyses of legislative acts and court decisions which provide legal sanction for the cooperative corpora-

¹ E. G. Nourse, "The Legal Status of Agricultural Cooperation," the Macmillan Company, 1927, p. viii.

² L. S. Hulbert, "Legal Phases of Cooperative Associations," Farm Credit Administration Bul. No. 50, 1942; and subsequent quarterly summaries of cases relating to farmers' cooperative associations from same source.

tion and the cooperative way of carrying on business. There is not available however, for the past two decades, the sort of economic interpretation of these developments as was made by Dr. Nourse in 1927. I trust we can encourage some of our truly advanced students of agricultural cooperation—and they are all too few in number—to provide us with similar careful analyses and interpretations in the light of the many changes and advancements of the past twenty-odd years.

In approaching this subject of integration of economic and legal thought, I wish first to outline briefly the emergence among farmers of the cooperative pattern of business organization and some of the legal implications involved in that development. Cooperative efforts among pioneer American farmers were of the informal type—barn raisings, husking bees, threshing rings, and the like—combining social with economic objectives. There were no legal questions involved—no problems of corporate structure. In the early 1800's however, the fragmentary history of agricultural cooperatives reveals a few examples of cooperative business enterprise—cheese factories in New England, livestock marketing in the Middlewest, and others of like nature. Mutual insurance probably pre-dated all these cooperative marketing efforts.

No information is available regarding the extent to which these early cooperatives resorted to the corporate form of organization. Dr. E. G. Nourse³ holds the view that profit-seeking and cooperative corporations developed side by side, though at somewhat unequal rates of speed and in more or less exclusive fields. He offers the proposition, "that, while the ordinary business corporation was developing such structures and practices as it conceived to be advantageous to itself, elsewhere in our economic fabric other groups of people under other motives and circumstances were fashioning another pattern. Such groups, styling themselves cooperative, were trying to organize a naturally decentralized type of industry for the large-scale operations demanded in a scientific, commercialized, and capitalistic day, while at the same time preserving the personal independence and dynamic element of individual participation and reward which seemed to be threatened under some forms of modern industrialization."⁴

The course of developments which provide legal sanction for

³ *Ibid.*, p. 25.

⁴ *Ibid.*, p. 23.

cooperative corporations and recognize in law their distinctive economic characteristics is no different in essentials than that outlined by H. R. Commons in developing his theory of the going concern. To quote from him: "Meanwhile, there has been growing up, through the decisions of the courts on cases as they arise, the theory of a going concern. . . . The working out of the theory by inclusion and exclusion of transactions that had to be adjudicated in the decisions of disputes has been necessary in order to do justice to those who had associated themselves together, had built up a business, had assumed responsibilities, had trusted to the credit system, in the hope that their past and present business connection would be permitted to continue in the future. These hopes could not be shattered, else the whole fabric of society would come down. The courts and legislatures find them there, in the customary transactions of individuals, then recognize them, then authorize them, and the authorization is the security of the working rules. New hopes are built on these authorizations, and that which exists in the very nature of Man's transactions with his fellows comes to exist also 'in contemplation of law.'"⁵ In short, emerging organization structures, business practices, and the like which meet the test of economic soundness and social acceptance will in time receive the blessing of legal sanction by legislature or court.

Dr. Nourse reports⁶ that the first stirring of cooperative effort in the early years of the nineteenth century left behind no reminder of itself on the pages of our statute books. This preceded the period of general corporation laws, and cooperatives seeking the corporate form as well as other corporations were chartered by special acts of the legislatures. It is probable, however, that most of these earliest associations operated as unincorporated, voluntary organizations.

By the time of the Civil War, most of the states had enacted general corporation laws. Naturally, the cooperatives organized subsequent to such enactments desired to gain the advantages of the corporate form if they could do so without too great sacrifice of cooperative principles. Various devices were used to fit the cooperative structure to the corporate pattern. For example, in order to assure patron control, inherent in the one-man, one-vote principle, under a statute requiring voting on the regular share basis,

⁵ *Op. cit.*, Commons, pp. 152-153.

⁶ *Op. cit.*, Nourse, p. 29.

limitations were placed on the investment and therefore the voting per patron. Where the general law required distribution of profits according to capital investment, effort was made in many cases to proportion investment in the cooperative to use by each patron. Still another idea—unique in character and a forerunner of the marketing contract which received so much attention from legislatures and courts in the 1920's—was the maintenance (often referred to as penalty) clause in by-laws of Iowa farmers' elevators which pointed up the mutuality of interest of members by requiring contributions on a volume basis toward elevator expenses for grain sales made by members outside their own association.

Most of the early farmers' grain elevators and creameries organized in the Middlewest before the turn of the century and in the first decade of the present century were set up under general corporation laws with some of them adapting the various devices cited above to assure some conformation to cooperative principles and practices. During this period, however, pressure was exerted by farmer and other groups for specific statutes that would authorize incorporation of concerns that were mutual, reciprocal or cooperative in character. A mutual insurance law in New York in 1857, a cooperative association act in Michigan in 1865, and a Massachusetts law in 1866, were among the first. There was little to distinguish these early cooperative statutes from the general corporation laws, but they were indicative of an effort to overcome the lag between economic thought and legislative enactments relating to cooperative organization.

With the passing of time, the weaknesses from the standpoint of sound cooperative practice in the organization of the early farmers' elevators and creameries became more apparent. It was all too easy for such organizations to lose their patron ownership and control and revert to the ordinary corporation form and practices of business operation. In short, there was not at that stage of cooperative development the integration of legal and economic thought such that cooperative principles and practices were properly reflected in legislative acts. Most of the early acts (the California law of 1895 was an exception) provided such slight modification of general corporation laws that they were not conducive to permanency in cooperative organization structures.

The pattern of state cooperative laws passed in the period 1910-20, starting with the Nebraska and Wisconsin Acts of 1911, did a

better job of reflecting the bare essentials of good cooperative practice than had the earlier enabling legislation. Even so, none of these acts reflected the more advanced economic thought of that period relating to cooperatives. Most of them were however—and desirably so—drafted in quite general terms so that they permitted considerable latitude in application of cooperative techniques and experimentation with new ideas. On the other hand, they did not provide a very broad base of statutory rule to assist the courts in the interpretation of points of issue.

The California Act of 1895 is deserving of special comment since it was a radical departure from the cooperative legislation of that period, and reflected cooperative thought quite distinct from that accepted in other parts of the country. And yet it was quite a logical development. Generally speaking, business practices adopted by the grain and dairy cooperatives of the Middlewest held pretty much to the "purchase-and-sale" pattern of other business firms and adhered to going prices. The cooperative device so well known then as the "patronage dividend" was utilized for the distribution of the excess of the margins withheld beyond the amount necessary to cover costs. In contrast, the pooling idea was tried out and attained a high stage of development among California and other West Coast cooperatives. This gave emphasis to more exact proportioning of costs to services rendered and to the mutuality of interest among members. In this latter connection the marketing contract was developed and refined—an excellent example of integration of economic and legal thought. The California law (first the act of 1895 and then that of 1909) brought into the statute books the new idea of personal membership and of the proportioning of capital among members on the basis of volume of business done. Gradually the enabling acts of other states have been amended or new acts passed accepting the non-stock pattern or adapting the proportioning-of-capital idea to the stock form of cooperative organization or both.

Thus far my comment has been directed primarily to the problem over the years of gaining legal sanction for the cooperative form of business enterprise, and for the practices which give it force in accomplished objectives of cooperative endeavor. This has been an evolutionary process whereby ideas are translated into procedures and practices found to be workable, then the move to obtain positive evidence of public acceptance through legislative

enactments rather than to depend upon judicial decisions to gain acceptance. Even so, the body of state and federal legislation relating to cooperatives is complemented by a considerable bulk of judicial decisions. A major problem is the uncertainty which prevails pending legal acceptance of new ideas, practices or procedures, whether gained by legislation or judicial decision. Aside from the enabling legislation, many other legislative acts carry provisions which serve to interpret their application to cooperatives as distinct from other types of business organizations.

The fact that this economic institution—the farmer cooperative—has received legal cognizance, that its distinctive character and practices have been recognized in law and judicial decision, that its right to exist alongside other economic institutions has been established is evidence in itself that there has been reasonable integration of economic and legal thought on the matter. Perhaps the extent of the time lag between the development of new ideas or practices or procedures and their legal and judicial rejection or acceptance provides us with a measure of the degree of integration of thought. In any case, I am sure you will agree that we still fall short of the ultimate in cooperative practice. We are still in the process of seeking the right answers to problems of a changing, dynamic economic institution. Sound integration of economic and legal thought may speed up the evolutionary process and help to come out with timely and correct answers.

Preliminary to setting down some of the specific problems of cooperative organization and methodology presently deserving the attention of students of law and economics, let me outline some of the fundamental concepts of the cooperative from which these problems arise. The first of these fundamentals is the operation-at-cost idea—an idea not confined solely to the cooperative form of organization. A second fundamental concept is that of ownership and control by those utilizing the services of the organization. A third is the concept of capital as a loan fund in contrast to its significance in the profit corporation as the residual claimant of margins in excess of costs of the other factors of production. The emergence of these concepts during the last century or more and their application and refinement in cooperative business practice is in a sense a chronology of the development of economic and legal thought relating to cooperative organization.

The progress of agricultural cooperation to date is in direct pro-

portion to the basic thinking on both theoretical and practical aspects. Richard Pattee, first president of the American Institute of Cooperation, made this statement at the first Institute sessions in Philadelphia in 1925: "We who are managers and directors and you who are professors and scholars should be able to get a more definite, a truer, a more ample understanding of the essential nature of the cooperative form of economic organization. Only with such deeper understanding may this cooperative movement be brought to the more perfect practice we hope to contribute to our country's economic evolution."

Dr. Nourse had occasion to comment on the statement made by Mr. Pattee, which is quoted above in part, at the 1946 sessions of the American Institute of Cooperation.⁷ After pointing out the progress made in 20 years in developing "at least the basic frame of reference for such an understanding of cooperation as an institution," he added this thought: "We must bring the broader and more flexible methods of social science to bear on its solution, not the narrowly limited mechanistic tools of natural science." I trust that social scientists generally will heed the urging of Dr. Nourse and devote time and inquiring spirit to cooperation which he characterizes as "a distinctive economic and social philosophy for the better organization of an important fraction of, and particular functions in, the business of agriculture."

The constantly changing pattern of agricultural cooperation makes it important that continued attention be given to the resulting problems. As cooperatives grow in size and complexity, there arise more than the usual problems of scale associated with bigness. What devices, what procedures need be employed that there may be no serious departure from the fundamental concepts of cooperative economic organization? How bring about operation at cost? How give assurance that control finally rests with those utilizing the services of the organization, avoiding the tendency toward management control so common in proprietary business and industrial concerns? How may member-patron control be exercised intelligently and in the light of adequate information? How about such problems as pooling and pricing which are distinctively cooperative in character?

These and many others are practical problems affecting day-to-day operations and yet of long-term significance. Then there are

⁷ American Cooperation, 1946, p. 9.

the broader problems which concern public policy toward agricultural cooperation. What is its effect on the functioning of our capitalistic economy and the future of American agriculture? What is its place in an agriculture involving price supports and production controls? How do the operations of large-scale cooperatives square with current ideas on monopoly and restraint of trade? Are cooperatives meeting their responsibilities to the general public in a way that is consistent with the corporate privileges granted by statute?

Such problems as these need the thoughtful consideration of economist and lawyer as well as management to assure solutions which will be economically sound, legally acceptable, consistent with good public policy, and yet workable business-wise. It is not enough, of course, for each to analyze and examine as a specialist in his own field. The inquiry must be both within and between the specialized fields in order to assure synthesis of the numerous and often conflicting points of view. By such means, the lag between the development of new and economically sound ideas or procedures in the field of agricultural cooperation and their acceptance by legislature and court will be minimized.

DISCUSSION

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The Hedges and Jensen papers have traced, in an interesting way, the slow growth of the tendency for the courts to differentiate between farmers' cooperatives and combinations of businessmen organized as corporations. I clearly recall my own early contacts with the problem in Ohio during the period 1917 to 1921. I saw zealous district attorneys prosecute the officers of several small fruit and vegetable cooperatives under the Ohio Anti-Trust Act with never a mention of corporate dealers who were doubtless more influential as price makers than were the farmers. At about the same time the officers of a milk producers' bargaining association were called out of bed at midnight and jailed under the same Act, while the powerful corporate dealers were not molested.

Evolution in cooperative structure has come largely by successive minor departures from current practices, much as the automobile of today is the result of many successive innovations. Take, for example, the widely used revolving finance plan. In California, crude plans are said to have developed among some local orange packing associations about 1914 or earlier. During 1917 attorney George E. Farrand developed the plan now used to revolve the capital stock of the Fruit Growers Supply Company in

order to keep its ownership in the associations which used it. At about the same time the California Fruit Exchange, then a capital stock organization, developed an entirely different plan to "revolve" funds originally withheld from earnings to build up supplementary working capital. Gradually, a host of variants of these early plans have found their way into cooperative structures, all of them designed to keep ownership and control of the cooperative in the hands of the active cooperators.

In this process of evolution both the lawyer and the economist have tended to accept the current law and its interpretation as facts to be accepted and have sought to build on them.

Differences in approach or interpretation may very well arise out of training or background. Note how many lawyers or economists tend to reflect the thought patterns of their former teachers. Such influences may well be found to explain some of the "lags" in thinking about cooperatives.

Referring to Robotka's "economic concept of a 'pure' cooperative" Dr. Jensen says its language is "strange to the lawyer, the legislator, and the courts." I share the opinion of Professor Paulson that it is also strange to economists. It is true that the economists' concept of a "business firm" as "a profit maximizing unit" does not fit cooperatives without qualification, but the quoted characterization is likewise not acceptable.

THE FUTURE OF THE GREAT PLAINS REAPPRAISED

ELMER STARCH
Great Plains Council

"**T**HE Plains have certainly changed" is an oft repeated phrase as we compare the economic collapse of twelve years ago with the well-being of recent years. The truth is that the Plains have not changed but have merely been demonstrating the extreme variations in production which prevail in an economy geared to a critical climate.

This extraordinary economic zone is located between two great divides. On the west the boundary is well defined by the Rocky Mountain Watershed divide. On the east is a climatic boundary which we have failed to recognize until lately. The climatic divide is of greater importance than the continental divide since it is also the economic boundary. It is here that the ordinary concepts of economics fail under very great strain imposed by critical climate. This divide, according to Thornthwaite, falls on a line which can be drawn about straight south from Fargo, North Dakota. He calls it the zero line which marks the division between the moisture surplus areas and the moisture deficient areas.

About two-thirds of a million farm families live in the zone between these two divides. These families have found that this zone is governed neither by the rules of a consistently humid climate, nor by the rules of a consistently arid climate. The stresses and strains set up under these circumstances are so great that there have been numerous economic breakdowns during the last seventy-five years.

President Roosevelt appointed a committee to study the problems and report on recommendations for this great area as a result of the 1936 drought. In his letter to the chairman he said, "We are anxious that we leave no stone unturned in exploring and reporting on all the possibilities of this region."

The Committee's analysis was made under difficult circumstances, as adverse weather had caused a complete breakdown of the economic framework inherited from areas with a reliable climate. Long accepted principles of resource management had worked well on the Plains through the series of favorable years. Suddenly, however, when physical disaster struck, the economic

structure disintegrated. The situation was chaotic, and the Committee's comments were directed to an analysis of badly disrupted conditions and to some remedial lines of action. Great emphasis was placed on what might be phrased, "Keep looking," or "Learn about the laws of Nature." Throughout the report it is recommended that study of the climatic, physical and economic phenomena be stepped up. Very strong localized participation was urged in education and program building. Through the participation of great numbers, the people of the Plains have made marked progress in skillful development of programs. This is perhaps the outstanding feature of the era.

The title of the original inventory and outlook of the Committee report is, *The Future of the Great Plains*. It is a reassuring title, because it declares that the Plains have a future, and it characteristically expresses the philosophy of the Plains that "next year will be a better year." But the recommendations didn't say to wait with folded hands until a turn in the weather bailed out the Plains economy.

Quoting from the Report of the Great Plains Committee: "The problem of the Great Plains offers no simple solution. Yet enough is known about conditions and their causes generally throughout the region, and in detail with respect to certain parts, to permit immediate and vigorous execution of a program of readjustment and development. Further studies of details should proceed simultaneously with the execution of the program, but the beginning of action should not be permitted to await these studies, which should in fact be a part of the program."

The Future of the Great Plains is not a blueprint. It does not claim to be a plan or even a program. It does not set up specific goals to be reached at a given time, but it does say that by the best combination of research, education and concerted action, a suitable way of living can be devised. It does try to appraise the dim outlines of the economic framework into which the programs will have to be built. The President's committee went one step further and said, "The local people must join their efforts in appraising the situation and developing a program." To that end they suggested a Great Plains Council wherein the programs could be crystallized.

The following sentence from the Great Plains Report expresses well the central thesis of the efforts which people have undertaken in this area: "In a sense the Great Plains afford a test of American

ways of dealing with matters of urgent common concern." Throughout a twelve-year history, democratic and concerted effort has met and dealt with a series of urgent problems. The concerted effort has borne results such as I shall refer to later, but never forget that the problems and the remedies were made a common concern of all the people living in the area.

Many of the recommendations of the Committee have been fulfilled, some of them far beyond original expectations. The experience gained in attempting to make improvements has caused economists to probe into underlying principles with which improvement should be aligned. Some features are becoming evident. As yet, they cannot be stated with too much certainty. However, programs may be measured to some degree by whether or not they do some of the following:

1. Provide stability through reserves in as many forms as possible— moisture, feed, seed, money, credit.
2. Provide extraordinary control and protection for resources throughout the cycles of production.
3. Meet the longer than annual intervals between paydays.
4. Give full play to flexibility in cropping plans, repayment of contracts, and even to region-wide expansion and contraction.
5. Maintain the highest possible level of output per man hour to take advantage of peak conditions and low cost per acre or animal unit in order to decrease the rate of dissipation of reserves during periods of stress.
6. Help adjust the community pattern to a sparse population pattern.

We have in the foregoing principles some very obvious conflicts. On the one hand the Plains people as a community and the farm operators as individuals are trying to evolve principles leading toward stabilization, and yet it is held that flexibility is the key-stone for every farm operation and every contract, as well as for the economic structure of the whole Plains. It is a case of being flexible in order to achieve stability.

Management principles for the Great Plains farmer must be such that he can shift quickly and roll with the punch. He can have a central core around which to swing his day to day management but he may have to shift plans rapidly. He must have speed to do jobs when the weather is right. He must be able to build up reserves when the situation is favorable. For instance, he may be planning to cultivate 200 acres of summer fallow. The rules say that he is to complete the first operation by May 15 for best results. However,

when a particular spring season is dry until June 1, he must change his operating schedule so that with the first rain he will be ready to do his first summer fallow operation. He will be wasting \$200 if he does that first operation according to a fixed schedule, and furthermore, he would be exposing his land to wind erosion. Flexibility is the essence of management of other reserves, also, especially livestock feed. A rancher can have a stock pile of three winter's hay supply, but if a drought begins in May and persists on through July, it will be the better part of wisdom to reduce his herd.

The whole economy of the Plains must be able to expand and contract in accordance with the dictates of demand for certain crops. The cropping history of the Plains has a somewhat similar history to that of the cut-over forest lands, where a tremendously big crop is taken off once in two or three generations. In the interim periods, however, there seems to be no satisfactory or systematic set of management principles. In the Great Plains a series of big crops may be taken off the land frequently and therefore the periods of restoring lands and protecting them from deterioration come more frequently, but they are just as hard to handle as are those same tasks in a forest area.

In our appraisal of the future of the Plains, let us examine a few of the adjustments that have been made in the light of those recommended by the committee twelve years ago and try to fit them into this maze of apparently contradictory principles.

1. Moisture conservation is paramount and all practices leading toward this end are an essential part of farm and ranch operation. Several effective practices have been incorporated pretty generally into the routine practices of the farm operator. One of these is stubble mulch. Stubble mulch increases the absorption of water into the soil, which becomes a form of reserve; furthermore, it also protects the surface against wind action. The time required is drastically lowered, giving flexibility to the labor schedule to meet the season's climatic peculiarities.

It is the result of two avenues of research. The farm management experimenter was looking for cheaper fallow operations. The agronomist was looking for an effective device for increasing absorption of rain where it fell. So the two fields of inquiry merged and resulted in a formula which is not only cheaper by \$2.00 an acre, but better.

2. The shortage of water for livestock added to the shock of the

great drought of the early '30's. Water was a limiting factor in some areas rather than grass. Even the movement of livestock to the railway sidings was hampered by the lack of water along the cattle trails. Stock water development was listed by the Committee as one of the "on farm" programs. The original estimate was 20,000 reservoirs. A Plains-wide program of assistance in building stock water reservoirs was developed, and that program combined with the hard work of the ranchers was so effective that 300,000 reservoirs rather than 20,000 were built. Watering facilities are now available within $1\frac{1}{2}$ miles of most all grazing resources, and the reserve water supply is likely to hold out as long as the grass supply. The costs can be charged partly to insurance and partly to increased plant efficiency.

3. Dust storms and spectacular wind erosion appeared on every side during the 1930's; therefore, extraordinary emphasis was given to protection from blowing soil and the ways and means of restoring lands to permanent cover. In the course of eight years, 10,000,-000 acres of wheat land have been restored to permanent grass. The restoration measure is not only one which applies farm by farm, but has community implications, inasmuch as a shift from more intensive wheat production to the more extensive grass production requires a drastic change in the size of the farm unit, and therefore every farm bursts out at the fences.

It is a protective measure, but its flexibility operates on a tremendously broad scope and has a one-way aspect about it. When the situation dictates a shift to wheat production, the change comes rapidly. The possibilities for returns are immediate. Manpower and equipment can be moved in readily. The larger ranch units can be broken into smaller wheat farms with the mere signing of a purchase contract (and at a good profit to the vendor). The grass lands can become wheat lands almost overnight. One county has increased its wheat acreage one hundredfold during the last eight years; mostly in the last four years.

When the economic and climatic situation calls for returning 10,000,000 to 20,000,000 acres to grazing use, it takes years to get a stand of grass and go through all the farm reorganization which accompanies this shift. It is costly and seems to require public assistance and certainly requires an outlay on the part of individuals from which they cannot hope to profit immediately.

The restoration of millions of lower producing acres of wheat

lands was a gigantic task well accomplished. But the Plains people are still in the process of learning the requirements which underlie flexibility on a grand scale. The community organization which accompanied the process of restoring land to grass was facilitated by the drawing off of manpower to the war industries. A study by Ward and Green entitled, *Geographical Differences in Production from Agricultural Land in the Northern Plains*, shows that by 1944 on a county by county basis a fairly uniform balance had been struck between the resources and the numbers of population. In the second round of restoration which is now before us, some of the factors which caused people to move to industrial areas will not be present, and therefore the balance will come less readily.

The accepted concept of marginality goes to pieces under the circumstances of a critically variable climate. Which acres are submarginal, those in central Kansas which produced an average of eight bushels during one ten year period, or those in western Kansas which produced an average of sixteen bushels in the ten year period immediately following? It is clear that we cannot use short time productivity records to determine submarginality. The determinations will be made on long time yield history and on the degree to which some soils are sensitive to wind action or water erosion. As these factors become established and accepted by resource managers of the area, then the adjustments to a particular type of production will be more permanent.

4. Utilization of water resources has advanced at a rapid rate, as the original appraisers of the future had hoped. Their emphasis was on small farm-by-farm irrigation. Records show that more than a million acres of crop land and meadow land have been put under irrigation in twelve years by the use of these small systems and it has been very largely of the type which added to the winter feed production of the ranch, or of the type which provided for the bridging of within-season droughts, as in the case of the pump irrigators of central Nebraska.

Irrigation systems both large and small must undergo a process of being adapted to a sub-humid climate if they are to give full results. First, they must be designed to give insurance against the effects of intermittent drought. Second, irrigation production must be fitted into an existing agricultural pattern. Third, the availability of water must be flexible.

Eight pilot projects which were established nine years ago to test

the usefulness of small irrigation projects of ten to twelve thousand-acre size scattered throughout the Great Plains embody the principle of an efficient design for farms which is comparable to the design for dams for safe and efficient water impoundment. Other principles, such as repayment according to productivity, and in some cases variable repayments, are being tried out. The integration of these projects into a surrounding agriculture has not been adequately tested as yet.

No mention is made in the Committee report of the gigantic water impoundments along the main streams of the Great Plains. However, in the course of fifteen years, engineering techniques have advanced to a point where one of the rivers of the Plains, the Missouri, will have a series of great water impounding structures. The experience in building earth dams derived from constructing the Fort Peck Dam, completed in the late '30's, has no doubt given impetus to additional great structures on the Missouri River. Large water-holding structures will no doubt be devised for other main streams as well.

5. Great stress has been placed on feed and seed reserves. The practice has been easy during these lush years; however, the original concept of feed reserves has undergone considerable revision. The cost of feed and the storage of feed should be balanced against the cost of maintaining a flexible livestock herd. The point of balance is still unknown.

It is being recognized more and more that a system of feed reserves is far more inclusive than having an extra stack of hay on each farm. Effective feed reserves cut clear across the board from the management of the open range, through winter grazing, through hay supplies, to well distributed stocks of grains, and in a larger sense includes the production of feed on irrigation projects.

There was some experience with stockpiles of grain during the late '30's and early '40's, when great supplies were under government storage. The distribution of these stocks did not conform to what the requirements would have been in case drought had come to any one community. Neither were the means devised whereby grains could be put in storage on a loan basis which would enable them to be withdrawn for feed purposes when and if needed.

We have also had some experience in efficient integration between production of hay on irrigation land and its use by the upland rancher. When conditions are favorable, the feed stocks of an

entire area are high. The irrigation farmer finds that the sale value of hay is extremely low. When the entire area is short of feed, the prices will be high, and the cost to the rancher is sometimes excessive, but the irrigation farmer has no more than one year's surplus production to sell at those advantageous prices.

6. Land ownership, or at least systematic control of lands, was the point of greatest concern with those who studied the prospects of the Plains in the middle '30's. The whole system of ownership seemed to have broken loose. In fact, Dr. H. H. Finnell says that much land became a dust bowl hazard because of lack of finances and lack of continuing management of land.

The years of prosperity have obliterated the weaknesses which caused 30 to 50 million acres of land to go out of systematic management during the drought period. It appears, however, that some of the land tenure measures which have been introduced will be effective in keeping land under some sort of management under extremely adverse conditions. For instance, there are about 5,000 farms in the Plains area which have been put in the hands of farm operators under a variable repayment contract. Also most loan companies have introduced the principle of forbearance. Not all of the mortgage contracts have this provision clearly stated. In case of widespread income failure, some of the confusion of the '30's might be repeated.

Partial ownership has come to be important in many areas. By means of partial ownership, the operator shifts some of the fixed cost to a second person. In some cases the second person is the government or some other organization which can forego returns from the land for indefinite periods, providing that the average is maintained through higher returns during favorable seasons. A methodology in the protection of equity, security of occupancy, and continuity of management is slowly coming to undergrid the Great Plains economy.

7. Institutional devices for protecting and managing resources are discussed at length in *The Future of the Great Plains*, for it looked as if individual managers were unable to cope with problems which were so widespread. The suggested devices include zoning and two new instruments, a district for the control of erosion and the grazing association.

Zoning embodies many of the principles which are required in a Great Plains instrument for control. However, it lacks the feature of flexibility.

Grazing associations have their application in areas which are quite obviously and permanently given over to range use. The grazing association provides for flexibility in that it envisages rapid changes of livestock numbers to coincide with the seasonal forage production. Flexibility in annual rental fees through the use of the cow-month basis is spreading.

The districts "for wind erosion control," such as were enacted in Texas, have been superseded by the conservation districts. Some of the state conservation district laws do provide for some ordinances which will encourage or discourage certain trends in land use. When a conservation district through experience evolves control devices, the district can become the medium for a systematic shift in land use that will no doubt some day include the measures which will enable manpower to come into an area and quickly convert it to wheat, but with certain protective restraints. These districts can also provide for a reserve fund, or measures which will quickly restore the grass cover on certain lands. If such measures are eventually devised, community disorganization will not be as great as it is at present.

8. Adaptation of public and private facilities to a sparse population pattern with its attendant small trading center, is perhaps the area of least progress. We have just lately begun to recognize that sparse population is a permanent and modifying characteristic of the Plains, and that the entire system of public and private services must gradually, even though painfully, adjust. Some of the states have initiated laws providing for redistricting of schools, but so far the implementation of these laws has met largely with failure.

I have recited a few instances where the economic strength of the Plains has increased through programs of improvement, but let me refer you again to that key sentence in the President's Plains Committee Report: "In a sense the Great Plains afford a test of American ways of dealing with matters of urgent common concern."

The Plains people have learned much about methodology of practical interpretation and concerted approach. The confidence of the future lies as much in the practical interpretation and concerted approach as it does in having found excellently adapted practices and in having seen major programs put into effect. It is for this reason that I want to give the five stages which seem to be essential to full cooperation in "dealing with matters of common concern."

1. Each of the problems to be attacked must be isolated so that the people may see specifically what its components are and what its effects are, so that it will be a clear-cut and manageable segment in the program of modification.
2. The remedy as well as the problem must be thoroughly understood by thousands of people. Such understanding results from a thorough-going discussion where farmers themselves work out the means for initiating the remedial measures.
3. The remedial measures must be tested as far as possible by the criteria of the area.
4. An inventory must be taken of the facilities at hand for doing the job. Many times the job involves public as well as individual interests and this point must be recognized by law or by the administrative adaptation of a program.
5. Concerted action must be obtained between the agencies that are concerned with assisting farmers in the process of adjustment and modification.

One may say that the foregoing stages are ways and means to overcome at least four major hurdles:

1. Individual adaptation, whereby managers of the resources set aside methodologies which have been imported from other areas or carried over from earlier years.
2. Institutional adaptations, which in many ways are harder to evolve than individual adaptations, because they require group action, changes in laws, etc.
3. National cognizance of the problem must be obtained, since all agricultural production has national implications.
4. Organizational geography tends to shape up according to convenience of travel and grouping of adjacent states. Ofttimes centers of problems are not only cut in two but into several pieces, so that they become incidental and fringe problems to groups which are considering studies of problems, educational means, or action.

In the re-appraisal of the future of the Plains, one must recognize that progress is being evaluated in terms of principles and measuring sticks which have not been fully crystallized, and also, that the tests must come over a long period of time, for what seems like progress in one era may prove to be just another weak link in the one following.

There are those who believe that the economy of the Plains could withstand the strain of a drought of the intensity of the '30's. That conclusion is by no means supported by the evidence. There are also those who maintain that it is impossible to devise enough adaptations in the physical field or to adjust our management con-

cepts to a point where the economy will be anything but a continual repetition of "boom or bust." However, the evidence is here to indicate that the economic structure is less likely to go to pieces under severe strain than it was when the area entered into the great drought of the '30's. We must remember that the Plains economy is subject not only to great droughts affecting the whole area, but to localized droughts which are in effect in some part of the Plains most every year, and the economic structure may be strengthened so that at least it could cushion minor droughts.

The Plains people have become less and less a "next year" people. They are recognizing that they are resource managers who must figure in terms of a long time performance. They can see by the statistics that if they can live in the Plains for twenty or thirty years, they will have a better than the national average income. So they are devising every means and using every skill that science and experience can produce in order to manage their resources and finances in such a way that they can maintain a high level of living and yet protect their resources.

DISCUSSION

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Mr. Starch mentions frequently the word "flexibility." Probably in no other part of the country is flexibility in farm organization and operation as essential to the achievement of *stability* as in this vast semi-arid country known as the Great Plains.

Particularly in the early part of his paper, it seems to me that Mr. Starch is too optimistic. For instance he says, "The Plains people are no longer 'next year' people." I doubt if this can be very adequately demonstrated until the next series of drouth years. The Plains people, are, as Mr. Starch points out, becoming more in the nature of "resource managers." However, it seems to me he infers they have achieved a higher degree of accomplishment in this direction than I am presently willing to concede.

I quite agree that if the people of the Plains can live here for a 20 or 30 year period they will, over that period, have incomes averaging higher than the national average. A real problem of Great Plains farmers and ranchers is, therefore, how to weather the lean years *in a satisfactory manner*, in order to take advantage of the high income periods.

Reserves in the form of moisture, feed, seed and capital accumulated during good years is undoubtedly the key to weathering the adverse periods. I am inclined to place greater emphasis on capital reserves and less on the others than Mr. Starch. At the same time I should like to point out

that the high income tax rates of recent years seriously impair this safety factor. The "net after taxes" is not going to permit "averaging out income" as we formerly attempted to do. Cash or readily convertible securities are important, but other types of capital reserves are equally important. Debt free ownership of the farm or at least a modest debt is one of the best reserves possible.

This matter of reserves leads logically to crop insurance. Farmers in no other part of the country stand to profit as much over the long pull from crop insurance as do those operating under the highly variable conditions of the Plains.

For many years there has been a trend among western ranchers toward a cow and calf type of operation. It is too inflexible. When a dry year with little forage production occurs the operator may have to dispose of a high percentage of his breeding herd and he is not in good position to expand when feed supplies become more abundant. A cow-steer type of operation gives far more flexibility. With the advent of very favorable grass years the steer operation permits rather rapid expansion.

Because there has been a considerable expansion of the cow and calf type operation we may expect a relatively heavy reduction of livestock numbers when drouth conditions return. Encouraging a return to a higher percentage of steers before drouth comes will be in the interest of operators on those ranches now following the cow and calf system.

Mr. Starch has indicated that considerable land use adjustment is necessary. Some of the obstacles that stand in the way of this adjustment are:

1. Under present conditions of favorable moisture and prices, farmers are not voluntarily going to give up the prospective income as a contribution to the cause of conservation.
2. The land is capitalized on too high a basis.
3. There is an acute shortage of grass and legume seed of adapted varieties.
4. Real estate taxes usually lag years behind any adjustment in land use.

There have been nine years in most parts of the Plains during which dissatisfied farmers and ranchers could sell to advantage. Because of the alternative opportunities prevailing, practically all of those on the land now are here by choice. They like the Plains and more than ever before they are spending money to improve their homes and make them permanent. The rugged conditions of the '30's constituted the most severe kind of test. For the most part there has been a "survival of the fittest." The future of the Great Plains rests primarily with the people themselves. They still have many adjustments to make. I personally believe it improbable that a drouth as serious as that of the '30's will occur again during my lifetime. I believe it even less probable that severe drouths of the future will be accompanied by the disastrously low prices of the great depression. The Plains already has experienced the worst! It is now far better prepared to meet future emergencies.

DISCUSSION

GEORGE MONTGOMERY

Kansas State College

The paper presented by Mr. Starch outlined effectively two of the basic economic problems of the Great Plains: the systematic control of resources throughout the productivity cycle and the development of social and political institutions in an area of sparse population. Toward the solution of problems of production and efficient use of resources from the individual's viewpoint, substantial progress has been made. In devising effective social control of resources throughout the cycle, the record of accomplishment is not as good. Soil conservation, grazing programs, control of wind erosion, and flood control, indicate progress in protecting society's interest in the resources of the Plains. But much remains to be accomplished. The recent war period, accompanied by good yields and high prices, encouraged the use of land for immediate gain of individuals without adequate regard for the maladjustments which may follow.

It has been pointed out that, "Plains people are no longer a 'next year' people. They are becoming resource managers who figure in terms of a long-time average." This is true, but they still figure in terms of a long-time average that will provide the largest individual income. Adequate consideration is seldom given to the social problems arising from the actions of individuals. The income obtained from wheat during the years of high yield and high prices was probably many times the income to be expected from grazing, and the annual net income may have been larger than the current market price of the land. Unfortunately, this maximization of individual income has not contributed to the stability of the agriculture of the region. We are now faced with the problem of shifting these extra acres from wheat back to grass in order to prevent reappearance of the specter of the dust bowl.

The problems of physical production in the Plains area were solved effectively under a system where the motivating force was private gain. The traditional independence of the pioneer, and the necessity for speculative gains as a reward for enduring the hardships of the frontier created throughout the Plains a philosophy of individual freedom in the use of land. The emphasis upon the independence of the individual in the right to use land as he chose, and the economic and political institutions created in the pioneer days have not provided a favorable framework for solution of problems of wind and soil erosion, problems of surpluses and fluctuating prices, and instability resulting from high natural risks. In the past much of the research in the Great Plains has been directed toward improving the efficiency of the individual and increasing personal incomes. With the fluctuations in yields, prices, and incomes, which characterize the Plains, society cannot afford to rely primarily on the self-interest of individuals to provide answers to problems relating to efficient use of resources and stability of income. The task ahead is one of developing techniques or organi-

zations for effective group action. Land-use classification and zoning are techniques which might be utilized to prevent excessive expansion of wheat acreage in periods of high yield and high prices. The soil conservation district, the grazing district, the irrigation district, are examples of group organization adapted to area and regional problems. Reliance upon group organization and local leadership should provide a more stable and efficient agriculture than can be achieved by monetary payments.

The paper providing the basis for this discussion refers to the "adaptation of public facilities to a sparse population as the weakest link." It is not only the weakest link, it is the one to which the least attention has been given. There has been a decrease in farm population in the fifteen years since "The Future of the Plains" was first considered. There has been a substantial migration from farms to the county seats and village communities. Apparently no one knows the actual extent of this migration in areas such as Western Kansas. Likewise little is known about the reasons for this movement, or to what extent the farm family has improved its lot by moving to the county seat or village. There has been concern about wind and soil erosion, but little attention has been given to problems arising from the movement of farm families. Inadequate appraisal has been made of the impacts of these movements on the schools, churches, and other social economic and political institutions. Relatively little is known about how the movement of the family to town will affect the size, organization and efficiency of the farm. Will it mean complete abandonment of livestock and poultry enterprises on those farms where the family resides in town? How will this migration affect the educational programs of 4-H Clubs and vocational agriculture? Substantially more information is needed on these trends which have such an important bearing on the future of the Great Plains.

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FARM BUSINESS SURVIVAL UNDER EXTREME WEATHER RISKS¹

RAINER SCHICKELE

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THE vulnerability of farm income to fluctuations in business activity and prices is notorious. In high weather-risk areas, the effects of extreme variability of weather are super-imposed upon the uncertainties and erratic performances of our national economy. The Great Plains are such a high-risk farming area par excellence, and I shall draw some illustrative material from that area.

John Wesley Powell, in his famous "Report on the Lands of the Arid Region of the United States" (1878), warned against the folly of allowing this area to be homesteaded. He visualized the settlement of most of the Plains in "pasturage farms" of not less than 2,560 acres in size. He considered irrigation the only dependable basis for arable farming in this area.²

During the succession of ten drought and pest years in the '30's Major Powell's report was brought to light again. People began to wonder; perhaps this settlement of the Great Plains was really all a big mistake. Then, during the '40's, years of exceptionally good weather and prices have given Great Plains farmers an unprecedented prosperity. Many debts have been paid off, farms enlarged, houses modernized. Yet, farmers ask themselves: How long will it last? Could we survive another drought like the '30's?

Such a long and severe drought might not recur again during this century; or it might start next year. It might be even longer and more severe; or it might be shorter and less devastating. Or the weather might, for a spell of years, hover more closely around some long-time average. Who knows?

Fundamentally, with respect to the time dimension relevant to planning and decision-making by individuals and groups, the weather factor in this region represents an uncertainty of a kind that seems to preclude actuarial determination of annual budgetable costs

¹ Abstract of a paper presented at the Annual Meeting of the American Farm Economic Association, Laramie, Wy., Aug. 19, 1949. The full text may be obtained from the author upon request. Journal paper of the North Dakota Agricultural Experiment Station, Project P143.

² 45th Congress, 2d Session, House of Representatives, Ex. Doc. No. 73, April 3, 1878, p. 22.

of weather risks. This may mean that a "sound" crop insurance program with premiums balancing indemnities over a reasonable time span (which could hardly exceed 15 years or so) might prove impossible; that the utmost thrift of individuals during good years would yield reserves insufficient to tide the farm business and family over long years of crop failures; that the nation might have to come to the rescue of Great Plains agriculture once or twice during a generation; and that if we fail to adapt our economic institutions to the weather uncertainty, we might fail to preserve dry-land farming in the Plains—or preserve it at a staggering social and human cost.³

Problem I: The Bunching of Poor and Good Years

The yield variability itself, high as it is, does not constitute the core of the economic problem. It is the bunching of poor and good years into long periods and their universal incidence that taxes the farm economy of the Plains. Let me illustrate.

In North Dakota, wheat yields averaged 11.8 bus. for the 13 year period of 1933–45. During the first five consecutive years, wheat yields were more than 30 percent *below* that average (<8.3 bus.); during the last five years, they were more than 30 percent *above* the average (>15.3 bus.), and only during the three years in the middle did they fall within 30 percent of the average—a very wide range at that, compared with yield variabilities of major crops in other farming regions.⁴ Every year since 1941 (i.e. eight years) wheat yields have been 20 percent or more *above* the 25 year average of 11.9 for North Dakota.⁵

If these wide yield fluctuations were fairly well dispersed over time so that poor and good years would tend to alternate, the economic problems of income instability would be greatly eased. People could then build up sufficient reserves in cash and kind during one or two good years to tide them over one or two poor ones. Premium rates for crop insurance would be much more amenable to

³ For the sake of simplicity of exposition, I assume that most of the present dry-farming area should remain in farming for optimum resource allocation.

⁴ During the same period corn yields in Iowa fell below 30 percent of the average in only two years, and exceeded 30 percent of the average in none of these years.

⁵ Over a 580 year period in North Dakota tree-ring studies suggest that there were 22 dry periods and 24 wet periods of three or more years, and only five dry and five wet periods of one or two years. The longest dry spell was 16 years (1782–1801), the longest wet spell was 39 years (1664–1702). See G. F. Will, Tree Ring Studies in North Dakota, *N. D. Agr. Exp. Sta. Bul.* 358, April, 1946, p. 23.

actuarial determination so that for any 10 or 15 year period indemnities could be made to balance premiums. An ever-normal granary program could be operated at less cost.

As it is, the cumulative economic effect of the bunching of good and poor years into periods of irregular length is highly disturbing to the planning of farmers and agencies. It results in widely dispersed probabilities of yield expectations and high individual and social costs incident to that uncertainty, in the form of bankruptcies and human despair or sporadic relief action from outside the region.

Therefore, one of our chief problems is to minimize this cost of uncertainty, to cushion the impact of a series of poor years upon the farm economy, and to build all kinds of "reservoirs" for catching as much as possible of the "rainfall profits" of good years.

The geographic incidence of poor crop years tends to be nearly universal throughout the region (in contrast to the incidence of hail, frost, fire or life losses for instance). This results in: (a) The difficulty of spreading the total annual cost of yield risk among the producers in a locality or even the region and expecting them to be able to carry such cost through the whole sequence of poor years; and (b) the need for carrying extremely large reserves of physical stocks and liquid assets, because the majority of Plains farmers will depend upon such reserves *all at the same time*. Just imagine what the size of the reserves of a fire insurance company would have to be if at irregular intervals 80 or 90 percent of all the insured houses would burn down simultaneously.

The bunching of the poor years and their universal and simultaneous incidence throughout the region suggest that it might be cheaper and more feasible to allocate part of the risk cost outside the region rather than make the region carry it all.

Problem II: The Critical Limits of Survival

The economic problems created by yield fluctuations and the bunching of poor and good years are aggravated by the structure of the farm business. Most farms are of the family type, varying in size roughly between one-half and two sections in grain areas, or 50 and 200 cows in grazing areas. The bulk of the labor force comes from the operator and his family and constitutes a fixed cost in the enterprise.

Rigidity of operating and living costs: If in a succession of poor

years net income available to the farm family is reduced below the minimum living requirements, the survival of the farm as a going concern and as a family home is threatened. Hence, it is not enough to consider only the amplitude of income fluctuation. Even more important are frequency and extent of income deficits below the level of minimum operating and living requirements of the farmer.⁶

For instance, if the net income is \$10,000, a poor crop slashing that income to one-third does not endanger the survival of that farm family; but if it is \$3,000, an income reduction to one-third—particularly if prolonged over several years—will wipe out farm and family. Plains' farmers have often been called gamblers; but gamblers rarely play for their homes as stakes.

The crucial problem of weather uncertainty for the farmer is to reduce the probability that crop hazards will cut his income below the critical limit of survival. To illustrate, let us construct a model of a typical wheat farm in the Northern Plains.

In this simple model, the effects of output variations due to weather from 67 to 125 percent of a long-time "normal" upon the disposable cash farm income are demonstrated.⁷ Such variation in output has but little influence on input costs; hence, they are held constant. An *unencumbered owner-operator* of average ability and with a family requiring about \$2,400 of living expenses to maintain a minimum adequate standard can just squeeze by on a two-thirds crop; a *moderately encumbered owner*, under present rigid debt and tax obligations, falls 30 percent below the critical family maintenance level—which he might manage for one year by postponing replacement of clothes and other temporary retrenchments in consumption expenditures, but which over a period of years will inevitably result in loss of the farm; a *heavily encumbered owner* can just squeeze by on a "normal" crop, but is completely at the mercy of his creditors in case of a two-thirds crop.

It is the *location of this critical limit of family maintenance* and the *reduction of the probability that a farmer's disposable income might fall below this limit*, which constitutes the heart of the income stabilization problem in the Great Plains.

⁶ We consider here the price level to remain constant.

⁷ Note how the relatively fixed cost structure affects the "net operator's income elasticity with respect to yield." A 30 percent reduction in yield (from normal) results in a 50 percent reduction in net income for an unencumbered owner, 60 percent for a moderately encumbered owner, 90 percent for a heavily encumbered owner—using rounded figures. The implication of this relationship is not sufficiently realized by economists who are developing the marginal analysis of production functions.

TABLE 1. TYPICAL NORTHERN PLAINS WHEAT FARM^a
(Assuming 1946-47 price level)

Item	Unit	"Good" Conditions	"Normal" Conditions	"Poor" Conditions
Wheat yield per acre	Acres	480	480	480
Cash receipts	bu.	14.8	11.8	8.0
Cash operating expenses	\$	8,700	6,900	4,600
Property taxes, insurance	\$	1,700	1,700	1,700
Net Cash farm income	\$	300	300	300
		6,700	4,900	2,600
A. Unencumbered Owner				
Disposable Cash income	\$	6,700	4,900	2,600
B. Moderately Encumbered Owner				
Debt payments on 5% ten-yr. mortgage of \$7,200	\$	900	900	900
Disposable Cash Income	\$	5,800	4,000	1,700
C. Heavily Encumbered Owner				
Debt payments on 5% ten-yr. mortgage of \$10,000; 6% short- term loans of \$2,000 over two years	\$	2,310	2,310	2,310
Disposable Cash Income	\$	4,390	2,590	290
Minimum Requirement for Adequate Family Living Standard ^b	\$	2,400	2,400	2,400

^a Adapted from W. D. Goodsell et al., *Typical Family-Operated Farms, 1930-47*, B.A.E. F.M. 55 and 70, U.S.D.A., Washington, D. C., April 1946 and Sept. 1948.—This is a 480 acre farm, with a real estate investment of \$12,000, and machinery and livestock investment of \$4,500.

^b For a city worker's family of four, the estimated costs of a minimum adequate family budget was around \$3,200 at June 1947 prices (See U. S. Dept. of Labor, B.L.S. Bul. 927, *Workers' Budgets in the United States*, March 1948, p. 22.) For a typical farm family of five or six a budget of \$2,400, or 75 percent of a city family of four, might be expected to provide a roughly comparable level of living.

This proposition needs emphasizing. The problem is *not* to stabilize income near a long-time "normal" level. It is rather to prevent the disposable income of any competent and honest farmer from falling below the critical level of farm and family maintenance as a result of weather and price factors beyond his control. Any income variation above this critical limit, however wide and erratic, does not seriously jeopardize the region's farm economy.

Character of Income Variability: To get a sense of the character of income variability, take North Dakota as an example. In terms of 1947 dollars, gross cash income from marketings per farm averaged \$4,600 for the 25 year period of 1924-48, and ranged from \$1,380

in 1932 to \$10,240 in 1947,⁸ or from 30 to 220 percent of the average (see Table 2). All years with a gross cash income 33 percent or more below average were consecutive, lasting 10 years.⁹

TABLE 2. FREQUENCY AND LENGTH OF VARIATIONS IN GROSS CASH INCOME PER FARM, IN 1947 DOLLARS, NORTH DAKOTA, 1924-1948, 25 YEAR PERIOD

Range Limits		Number of Years	Percent of all Years	Length of Consecutive Years
In Percent of Average	In 1947 Dollars			
Under 50%	2,300	8	32	8
Under 67%	3,100	10	40	10
Under 80%	3,700	12	48	11
80-120%	4,600 average	6	24	2, 3, 1
Over 120%	5,500	7	28	7
Over 133%	6,100	7	28	7
Over 150%	6,900	6	24	6

What does this mean in terms of the critical limit of farm business and family survival? These figures represent gross cash incomes from marketings out of which all operating and living expenses as well as debt and tax payments had to come. State averages are notoriously inadequate to answer this question satisfactorily. We hope soon to get income distribution estimates which should throw considerable light on this problem of critical limits. In the meanwhile, we might get a very rough idea from the material at hand.

Under a parity ratio of around 95, and under "normal" crop conditions, we can assume that something like one third of the cash receipts from marketings is required to meet current operating expenses and taxes on the majority of North Dakota farms. The parity ratio for the 25 year period was 94. Let us assume that on the average about \$1,500 was required from the \$4,600 to cover these expenses, leaving an average disposable income (except for income tax) of \$3,100 to an *unencumbered owner-operator*. If necessary consumer expenditures for a typical farm family required \$2,400 (in terms of 1947 prices), \$700 would have been available on the average for savings and improved living.

⁸ Based on data from "The Farm Income Situation," B.A.E., U.S.D.A. Cash receipts are divided by the U. S. "Prices Paid" Index, 1947 = 100.

⁹ The variability of *net* income is, of course, much greater than of gross income.

See "Risk-Bearing in Agricultural Production in the Great Plains—Based on a Study of 246 Kansas Wheat Farms." B.A.E., U.S.D.A., July 1949. (mimeo.)

The crucial question now is: In how many years and how far did the disposable income fall below the critical limit of family maintenance for unencumbered and encumbered owners? In 13 out of the 25 years, an *unencumbered owner-operator* with a period average of around \$4,600 gross cash income could not have maintained family living expenditures at \$2,400. A *moderately encumbered owner* could not have maintained that living level and an annual debt payment of \$900 in 16 years of that period, of which 15 were consecutive. He would have had a *negative* disposable income in eight consecutive years (1931-38). It is estimated that around one third of all North Dakota farmers lost their farms through foreclosure during the '30's, largely as a result of these conditions.¹⁰ Most farmers were forced to reduce operating and living expenses way below requirements for efficient production and minimum adequacy in family living—to the detriment not only of themselves, but of community welfare and the land as well.

The cumulative effect of the bunching of poor and good years is demonstrated in Table 3. An *unencumbered owner-operator* of an average size farm who started farming in 1924 would under the assumed conditions have entered the '30's with a saving of \$2,100 (of 1947 purchasing power). During the next 11 years, he would have had to go into debt for \$17,500. From 1941 on, had he kept his expenses at the \$3,900 level he would have saved by 1945 more than sufficient (\$17,900) to repay the incurred debt, and would have wound up by 1948 with a net saving over the 25 year period of \$17,350. For an *encumbered owner*, the last 25 years would have wound up with a net deficit of \$5,100 in 1948. In order to maintain the assumed expenditure level, he would have had to borrow between 1926 and 1940 \$32,800—a sum quite beyond his reach. Still, his deficit of \$5,100 might be wiped out by two or three more good years so that he might get into the clear over a 25 to 30 year period. Then, again he might not. This is much too long a time-span for an individual farmer to plan his finances. There can never be any certainty that the deficits will be offset by surpluses within any predetermined time period relevant to individual planning and decision making. The implications of these characteristics of income variability are far reaching.¹¹

¹⁰ See Schickele and Engelking, *Land Values and the Land Market in North Dakota*. *N. D. Agr. Exp. Sta. Bul.* 353, June, 1949.

¹¹ See also Carl P. Heisig, *Income Stability in High-Risk Farming Areas*, this *Journal*, No. 1946, pp. 961-972.

TABLE 8. EXCESS OR DEFICIT OF DISPOSABLE FARM INCOME (IN 1947 DOLLARS).
IF AN ANNUAL FAMILY LIVING COST OF \$2,400 HAD
BEEN MAINTAINED, NORTH DAKOTA, 1924-48*

Period	Excess or Deficit of Disposable Income			
	Unencumbered Owner		Encumbered Owner	
	Excess	Deficit	Excess	Deficit
1924-29	\$ 2,449	\$ 348	\$ 221	\$ 3,520
1930-40	—	19,615	—	29,515
1941-48	34,868	—	27,868	—
1924-48	37,317	19,963	27,889	33,035
Net	+17,354			- 5,146

* "Disposable" income except for income taxes.

The Goal

These characteristics of weather uncertainty and yield variations, in conjunction with price uncertainty and the closeness of the long-time average income level per farm to the critical limits of business and family survival, suggest the following over-all goal for remedial measures to stabilize the farm economy in high-risk areas:

We must find ways, through a combination of individual practices and public policies, that will enable any competent and honest farmer operating an adequate-size unit to ride out periods of drought and very low incomes without starving his family, robbing his soil and losing his farm.

We must discover and apply new farm management and business practices, cooperative methods and government programs that will provide an adequate minimum of economic security over the years for any farm family willing and able to do its share, in face of extreme weather and price hazards.

More specifically: *when, due to no fault of the farmer, his product value falls below the critical limit of necessary farm operation and family maintenance, he should have an opportunity to draw upon sufficient resources from within or outside his enterprise to maintain a minimum adequate level of expenditures.*

As much of those resources as possible should come from *within* his farm unit, from reserves and insurance premiums that he can reasonably be expected to build up and maintain economically on his own. Beyond this source, additional stocks and funds will be needed by many farmers during one or more periods in their active years which will have to come from *outside* their enterprise, in the

form of crop insurance indemnities, credit of various kinds including debt and tax deferments, and in extreme emergencies even public grants in aid (of which price supports represent one kind).

From the viewpoint of resource allocation, the disruption of an adequate-size farm as a going concern under average management due to weather hazards entails a social loss; from the viewpoint of personal income distribution, the disruption of a competent and honest farm family through prolonged deprivation and eventual dispossession as a result of weather hazards spells undeserved hardship and drags a long train of social costs, unrest and frustration in its wake.

The goal is not primarily to reduce yield uncertainty, but to reduce the impact of yield uncertainty upon the security of the farm economy. The goal is not to stabilize income at some long-time average level, but to place a floor at the critical level of farm and family survival. The goal is not to depopulate the high-risk areas down to the Indian level of man-land ratio, but to secure a pattern of farm sizes where each unit is large enough to apply modern production technology and to support a family at acceptable standards of living *under conditions of long-time average yields.*

Remedial Measures

Crop Insurance: The first question might well be, whether the physical yield uncertainties can be converted to "known risks." Frank H. Knight points out: "when the technique of business organization has reached a fairly high state of development, a known degree of uncertainty is practically no uncertainty at all, for such risks will be borne in groups large enough to reduce the uncertainty to substantially negligible proportions."¹² He distinguishes between three different types of probability judgments: "a priori probability" as exemplified by throwing a perfect die; "statistical probability" determined by mass observation and classification of instances in frequency distributions, e.g. fire hazard for buildings; and "estimated probability" derived largely from our intellectual capacity "to form more or less correct judgments about things," from "an intuitive sense of value," such as the estimated probabilities of various relevant events upon which an entrepreneur bases his business decisions.¹³ Only the first two types of probability

¹² F. H. Knight, *Risk, Uncertainty and Profit*, p. 47.

¹³ *Ibid.*, p. 225.

can be expressed in terms of actuarial valuation of risks. Certain specific meteorological components of the factors determining crop yields could conceivably be evaluated in terms of "statistical probability."¹⁴

It has been estimated that fairly accurate yield histories over a 25-30 year period would be required in order to establish premium rates which would approximately balance indemnities over such a period.¹⁵ The principles involved here may well have much broader socio-economic significance. The unevaluated *total* uncertainty of a given type of occurrences (in this case wheat yields) is broken down into two parts: (1) one part represents a valued risk determined by limited statistical observations of certain occurrences (e.g. yield deficiencies) over a relatively short period (e.g. 10-20 years)—the cost of this "partial risk" being borne by the "insured"; and (2) the other part represents "residual" uncertainty for which we have no way of calculating probabilities and hence cannot determine its risk value—the cost of this "residual" uncertainty being borne by society whenever it rises above the individual's ability to bear.¹⁶ The contractual provisions establishing premium and indemnity rates, therefore, must rest upon a combination of Knight's "statistical" and "estimated" probability judgments—with a strong accent on the latter.¹⁷

Grain, Feed and Cash Reserves: Because of the great uncertainty regarding the length of the good and poor periods, the width of the gap between poor crop output and critical survival limit, the movement of future prices, and the technical limitations of farm storage, I suggest that emergency grain and forage reserves on individual farms can hardly be expected to do more than compensate for a partial

¹⁴ G. Blumenstock, Drought in the U. S. Analyzed by Means of the Theory of Probability. *U.S.D.A. Technical Bul.* 819, April 1942, p. 61.

¹⁵ Summary Report of the Wheat Crop Insurance Consulting Committee, June 30, 1942, p. 17. Also Report of the Federal Crop Insurance Corporation, 1947, U.S.D.A., p. 7. See also Harold Halcrow "The Actuarial Structures for Crop Insurance," this *Journal*, Aug. 1949, Vol. 31, No. 3.

¹⁶ To conform with our goal, it should be worth exploring whether indemnities could be geared specifically to the "survival requirements" of individual farms.

¹⁷ Essentially this splitting of "total uncertainties" into a "budgeted partial risk" cost and an unbudgeted "residual uncertainty" cost is also implied in our unemployment insurance program where the compensation for a stated period of unemployment (e.g. six weeks or two months) is covered by premiums collected and where any "cost" of unemployment beyond that "insured" period is borne by the individuals and by society in some way through relief or public works. In this case, however, society's commitment to bear the cost of the "residual uncertainty" of unemployment is, at least in the U. S., not as explicit as in the case of crop insurance.

crop failure of one year. To carry larger reserves would in most cases prove economically unjustified. Within this limit, however, the returns from such individually accumulated reserves, especially of feed grains and forage, might be very substantial.

What might be an appropriate extent of *a centralized grain storage program?* Storage cost and rate of deterioration are probably substantially lower in terminal elevators than on the farm. As a specific measure for implementing our goal, an *emergency grain storage program* might be conceived that would permit farmers in poor years to *borrow grains up to their survival requirements* and to repay such loans *in kind* during good years with a modest interest charge. The price risk would thus be borne by the government, and the price-stabilizing effect of the storage program itself would reduce the cost of this risk to a minimum.

Cash and other liquid assets are not quite as "idle" as physical reserves as they can earn a small interest. They have no storage cost and do not "deteriorate." The increase in returns if they were invested by the farmer over the nominal interest they draw as liquid savings, however, should be charged against them. On the whole, liquid asset reserves as a safeguard against weather hazards are probably superior to grain or forage reserves kept for that purpose by individual farmers.

Drought Credit: In strictly economic terms, there is no reason why the saving should take place before the event of a poor period. In fact, the inexorable uncertainty of weather hazards speaks very strongly in favor of saving *after* rather than before. The type of credit should be one of "budgeted" or "supervised" loans, administered along the lines of FHA production loans, with local farmer committees advising the agency on applicants' eligibility, and with the borrower agreeing to budget his repayment schedule according to his ability to repay, in consultation with the lender. The agency should have ample power to exact repayment as soon as income rises above the critical survival limit. In all cases where repayment is delinquent on account of the borrower's negligence, incompetence or ill-will, the lender should have all the legal remedies for collection at his disposal.

Flexible Debt and Tax Payments: The foregoing three measures of crop insurance, reserves and drought credit are designed to compensate for income deficiencies below the survival limits caused chiefly by weather hazards. Such deficiencies can often be reduced

from the cost side, by adjusting traditionally fixed cost items to the income flow, to the farmers' ability to pay. The crucial cost items which lend themselves to such adjustments over time are debts and taxes.

The principal issue is how to apportion debt payments *over time* rather than bringing flexibility into the total amount of the debt obligation. I believe in using the full force of the law to safeguard the total amount of the lender's claim upon his debtor; but I am convinced that stability in the farm economy in high-risk areas requires the breaking of the time-rigidity of debt payments. Perhaps the most important type of measure would be a pattern of deferment privileges. The deferment should be granted subject to the borrower's agreement to budget his repayment schedule in consultation with the lender, as soon as his farm income rises above the survival limit. The same reasoning holds for making real estate taxes more flexible over time.

Diversification: Much is being made of diversification as a means of reducing price hazards in the Great Plains. Perhaps price variability of livestock products is significantly lower than that of grains. Undoubtedly, output variability in livestock enterprises is lower because of substitutability among feeds and greater managerial control over input-output ratios. Climatic and market conditions in the Plains place rather severe restrictions upon diversification. Lloyd Barber in his Kansas study found only slight differences in yield variability between the various crops, with wheat yields showing the lowest variability in most cases. Diversification within the crop system, therefore might not substantially reduce output variability due to weather hazards.

Opportunities for diversification in the Plains, however, do exist along two lines: (1) fuller use of non-crop land and land submarginal for crops in many years, say five or more out of ten, and (2) fuller use of under-employed family labor, especially during the winter season. Diversification that takes advantage of these two opportunities helps to prevent income from falling below the critical limit in three ways: by raising the level of income, by reducing the variability of total farm output, and by reducing price uncertainty.

Increasing Farm Size: Yield reduction due to crop hazards does not reduce appreciably the total cost of operating the farm. Operating costs, family living requirements, debt and tax payments stay practically the same whether the crop is good or poor. For this

reason, a larger farm is less vulnerable than a smaller one, within certain limits. A 50 percent reduction in net income means something very different to a farmer with a "normal" \$5,000 income than to one with a "normal" income of \$2,500. Hence, a fairly substantial level of "normal" output reduces the probability that a poor crop will press farm income down below the critical level of survival.

Price Supports: The specific significance of price supports to the high weather-risk areas of the Plains is two-fold: (1) price supports reduce the risk of poor crop years coinciding with ruinously low prices, and (2) grains are the dominant cash crop and have the highest price variability of any major farm product. The heavy dependence upon grains constitutes a serious price hazard which can be substantially reduced by effective price supports.

A long-range price support program that will prevent ruinously low crop returns, *but will not price the region's products out of their markets*, should be particularly helpful in stabilizing the Great Plains economy. A warning needs to be sounded, however, regarding production controls as a means for supporting prices. The danger that a drastic acreage reduction may coincide with a near crop failure is here much more serious than in low weather-risk areas.

There is a high premium for ingenuity, for finding new ways of doing things and for shaking off practices and institutional arrangements that were brought to the Plains from the humid east, and that do not fit the high weather-risk and arid characteristics of the Plains. Everytime a competent and honest farmer loses out in his fight against crop hazards, the region throws a challenge to the resourcefulness of farmers, community leaders, researchers and educators, to the wisdom of statesmen in our farm organizations, state legislatures and Congress. They all are called upon to make their contribution to the fullness and security of rural life in the Great Plains.

THE PROBLEM OF FARM BUSINESS SURVIVAL IN AREAS OF HIGHLY VARIABLE RAINFALL

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RESEARCH on the problem of farm-business survival in areas of highly variable rainfall should be relevant in terms of yielding information on questions that have considerable long-time significance.

One such question concerns the conditions which cause some farm businesses to survive and others to fail in the same general economic environment. Is there evidence that the farm-firm which survives has been adapted successfully to areas characterized by extreme weather variability; or has survival been the result merely of historical accident or of the industry and good management of the farm operator? How one is to define "survival"—whether in terms of the continued existence of the farm business, in terms of some minimum degree of income stability or on some other basis—can be left to the discretion of the individual research worker.

A second question relates to the degree of stability farmers can afford. Can the farm business that takes adequate measures to safeguard itself against failure earn enough more in the long run to cover the added costs of this protection? In other words, is financial stability of the individual farm business feasible on a business basis in the face of extreme instability of yields and within the present competitive structure of agriculture in this area?¹

A third has to do with the personal distribution of heavy losses and heavy gains in high-risk agriculture. To what extent are the heavy losers and heavy gainers the same, and to what extent are they different groups of people? It is possible that returns from farming in high-risk agriculture over a period of years may average out as high as, or even higher than, those in other kinds of agriculture.

A final, but important, question concerns the attitudes that lie back of the competitive structure of farming in the area. To what

¹ Could a farmer who desires this degree of protection secure a larger net income as the operator of a more stable type of farm business in some other area, such as on a Wisconsin dairy farm, than he could earn on a farm characterized by highly variable crop yields? If so, the question arises as to what degree of protection is a reasonable goal for the farm operator under the present organization of farming in the area.

extent would the farmers of the area be willing to forego the opportunities for large gains in order to minimize the chances of disastrous losses? In theoretical terms, what is the nature of the "risk-preference function"? One aspect of this question is the extent to which the probability of losses is consciously anticipated by farmers who commit their resources to this area. Little, if any, empirical evidence is available with which to evaluate this question. In a sense, we are asking about the nature of the supply curve for entrepreneurship in high-risk agriculture.

These and similar questions help to identify needed fields of research, but they may not provide the most effective points at which to begin. It may be that we can learn something from the physical sciences about selection of specific projects. As in those fields the more effective research often may be that which superficially appears to be far removed from the central problem.

In the brief outline of specific fields of research which follows, two broad approaches are suggested. The first takes as given certain institutional arrangements, including public policies and the general competitive organization of farming. It then examines a number of possible lines of action that the individual farm business might take to safeguard itself against failure. The second takes as given an assumed pattern of farm business management and then inquires as to the costs and effects of public policies applied to entire areas.

Organization and Financial Management of the Farm Business

Research projects in this general field may be further divided into those with primary emphasis on the technical aspects of farming, and those that place primary emphasis on the financial aspects. What contribution to stability, and at what cost, may be expected from specific cultural and other strictly physical farm-management practices? This is largely a job of interpreting the results of physical science research in terms of costs and returns, with emphasis upon the contributions to stability of the farm business.

In this category falls research on the efficacy of physical reserves held by the farm business to increase stability of operations of the farm plant. To what extent can the stabilization of operations through the maintenance of feed and seed reserves be expected to give protection against financial breakdown of the farm business? It is conceivable that under certain conditions such farm-management policies might even lead to a greater degree of instability, as

when large physical reserves are held at the beginning of a period of falling farm prices.

Diversification of the enterprise and the provision of flexibility in the farm plant to allow a wide choice of alternatives are other stability measures of a primarily technical nature that require study. Within the rather narrow range of alternatives that exist in areas of high weather risk, do increased diversification and flexibility offer gains in stability that are at all commensurate with the costs?

In all of these problems, the characteristic uncertainty and variability of farm prices add to the difficulties of analysis. Prices are at once an important independent cause of instability and a factor which the research worker must include in his assumptions in studying the problems of weather risks. The widespread financial distress experienced in the Great Plains during the 1930's followed the occurrence of repeated crop failures in a period when farm prices were generally depressed. What the effect of such a series of poor crop years would have been in the absence of low farm prices presents a somewhat different question.

On the side of financial practices, we need to know more about the extent to which reserve and borrowing practices can contribute to greater financial stability of farm businesses. Holding liquid reserves in the form of cash and readily marketable securities may be viewed in part as the combination of a stable, low-yielding investment business with a relatively unstable farming business. The stable investment business is such that it can be liquidated or expanded with little inconvenience. Phrased in these terms, the question of the cost of such protection may be considered in terms of the returns that might be obtained by concentrating all of the capital in the farming business.

Whereas business-management practices as to financial reserves can be decided largely by the farm operator, the use of credit and the terms and conditions of borrowing depend also upon the lender. Unless a public lender is willing to take large risks as a matter of public policy, the contribution of credit to farm-business stability will be limited to the amounts loaned and the terms and conditions granted by lenders who are seeking to protect their own financial stability. Within these limits, however, lies a broad area of research as to the extent to which it is reasonable to attempt to use credit to supplement farm income in providing the funds to continue a

farming business in years of low income. Assuming that a farm operator has an assured line of credit, should he invest in farming assets and rely on credit to tide him over, or should he place more reliance on financial reserves in the form of low-yielding assets? The answer very likely may be that it depends. Even so, we should be able to determine upon what it depends in order to form a better idea of the respective limits of these related methods of accomplishing the same objective.

Of somewhat the same nature are research problems that relate to the use of insurance as a device for protection against catastrophic losses. The contribution of insurance, except that which may be provided on a cost-sharing basis by a public agency, depends upon the limits imposed by insuring agencies as well as upon the use the farmer makes of insurance. But within these limits are many questions relating to the extent to which stability can be promoted by agreeing to a schedule of fixed insurance charges as the price of protection against hazards which may be unrelated to the major forces that determine fluctuations in farm income. Here one of the problems is the extent to which protection against catastrophic losses is feasible without thereby building up fixed insurance charges that may accentuate financial difficulties in prolonged periods of low prices and yields. In this field fall also life insurance for the family as well as health, accident, and liability insurance. Here, as elsewhere in the consideration of methods of protection against failure of the farm business, the question often is one of how much protection is feasible under the present competitive organization of farming in this area.

In some respects equity investment by outsiders in the agriculture of the area is the converse of maintenance of liquid reserves by the operator. In the case of equity investment by outsiders, two separate businesses are combined in one operating farm. The farm operator conducts a farming business with leased assets and the outsider conducts an asset-owning business; whereas the owner-operator who maintains large financial reserves operates both a farming and a low-yield investment business. In the former, stability is achieved by placing a part of the uncertainty-bearing on an outsider. In the latter, greater stability is achieved by investing in high-grade, low-yielding assets.

This is not the place to speculate on the best techniques for studying these problems or to anticipate results that might be ob-

tained. The scarcity of usable data, however, will continue to tax the ingenuity of research workers. Most of the data now available are byproducts of some other process. Emphasis needs to be placed on the systematic development of statistical series for individual farms that will permit construction of the empirical models needed to study most of these problems. This means that existing data need to be studied for what can be gotten out of them, both as to substantive results and as to ideas for future collection of data. Building up a body of basic data and development of appropriate concepts and other tools of economic analysis are slow jobs at best. The sooner we get started at them the sooner will it be possible to do an effective job of reducing the area of controversy over appropriate farm business and financial management by a corresponding enlargement of the area of tested knowledge about the problem of farm-business survival in the high-risk agricultural areas.

In studying the types of problems outlined above, the research worker should be prepared for results which indicate rather narrow limits within which the individual farm can deal with the business-survival problem. Nevertheless, until we know more about these limits we are not very well prepared to say in what respects governmental or other group action is a superior method of handling the problem.

Governmental Action Affecting Entire Areas

We turn next to the second broad area of research which focuses on action of government in relation to entire geographical areas.

To do effective research, it is often necessary to hold constant for the time being certain phenomena that are not under study at the time. In a study of governmental and other group action to protect farms against failure, it may be most useful to assume that farm business and financial management is constant. One needs to assume also that there are limits to the costs the public is willing to incur to promote greater stability of farm businesses. With outside limits on costs, it is then possible to inquire regarding the specific costs and probable effects of a number of possible kinds of governmental action. Here again it is useful to distinguish between those activities of government that are designed mainly to influence technical aspects of farming and those that operate more at the financial level.

In studying the effects of alternative public policies in this field,

the research worker should take some liberties in assuming, for the sake of analysis, that legal and other institutional obstacles could be overcome if society really wished to follow particular lines of action. If the research worker restricts himself to his specialized job he should be free to study probable consequences of possible policies that seem at the time to be far removed from the realm of immediate adoption.

Hence, one area of research in governmental action relating to the technical aspects of agriculture might well be to determine the effects of specific regulations or inducements designed to direct high-risk agriculture into types of farming that are subject to less variation in yields. It would be instructive, for example, to assume that during the middle 1920's certain areas had been definitely zoned against crop-farming, and then follow through the next 25 years to determine probable net income both under this plan and under farming practices that have been actually followed. We might find resource allocation for the entire period has not been too badly out of line, but the personal distribution of gains and losses might be unsatisfactory.

A more tangible subject for study is the amount of stability for a given amount of cost to be expected from public expenditures on irrigation development. Considerable empirical data are available for such research. To what extent do higher fixed charges and greater vulnerability to small variations in prices replace greater variability in yields as potential causes of farm business failure when a shift is made from dry-land to irrigation farming? How much stability to entire communities, including adjacent dry-land farming, is given by irrigation farming? What does irrigation farming do to the distribution of uncertainty-bearing among farm operators, absentee landlords, and creditors; and is the resulting capital structure more or less vulnerable to variations in prices and costs than that characteristic of dry-land farming? Although it may require some ingenuity, the research worker may find that much of the basic data for such research is already available.

On the financial side, the research worker should also give considerable freedom to his imagination in the choice of projects. For example, what would be the fiscal cost and the distribution of benefits of a minimum net income guarantee to each farm family in a specified area? Similarly, what would be the fiscal cost and income effects of a government-sponsored crop insurance program in

which a specified part of the insurance premium was carried by the Government? What would be the net cost to the Government in the form of reduced income-tax collections of a plan whereby (1) the income-tax accounting period would be made long enough to average out years of high and low income, and (2) the farmer would be required to invest in government bonds in years of high income to obtain the advantages of tax reduction? Assuming that the public is willing to incur a given level of costs in one form or another to reduce the rate of farm business mortality in this sector of the economy, research studies of this type should provide a better basis on which to debate the relative merits of different programs involving similar cost to the Government.

The research areas so far discussed have emphasized direct stabilization of income. On the expense side there are also possible policies whose probable consequences need investigation. What, for example, would be the fiscal cost and probable effectiveness of a government-sponsored credit institution with power to finance specified fixed charges of both farmers and local governments in times of low farm income? The specified fixed charges presumably would include fixed operating costs of both farms and local governments when they are viewed as going concerns. Important in the consideration of effectiveness of such measures is the question of *which*, and what proportion of, farm businesses would be helped immediately by such a financing arrangement. Such a study would need to consider the prospect of losses on loans in evaluating probable public costs.

As emphasized at the outset of this paper, a real contribution can be made by research to the intelligent consideration of important public policy questions without attempting to give answers to questions that are political by their very nature. It is not serious if we spend time enlarging our knowledge of possible effects of actions that are never taken. Probably the transfer of basic knowledge from one area of investigation to another is large. There is even danger that we shall be so practical in our short-run choice of research projects that we may still be dealing with the depression of the 1930's when new problems arise.

DISCUSSION

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The Great Plains may be characterized—as has been done by Dr. Schickele—as a region within which good and bad crop years have occurred in bunches. In spite of this bunching, students of this weather and yield experience are almost unanimous in their conclusion that no definite pattern of length or sequence in weather cycles has been established. In one study based on tree-ring growth, covering 534 years, it was concluded to be impossible to work out any definite pattern of yield series. In another tree-ring study, covering 152 years, the conclusion was that cycles could not be picked out very successfully. In a study of wheat yields representing all the major wheat producing regions of the world it was concluded that chance presumably dominates fluctuations in yields from year to year in individual regions.

Thus, changes in weather from year-to-year usually have been regarded as random fluctuations and scepticism is general as to the existence of periodic cycles in meteorological data. This does not imply that the irregular fluctuations are entirely accidental or fortuitous, but for purposes of prediction the pattern and sequence of weather phenomena takes on the character of a random statistical probability. The bunching of good and bad crop years which has appeared so pronounced in the Plains in the last 20 or 30 years may be a random occurrence in the long range view of weather of the Plains. Uncertainty exists in respect to the weather for next year, for the next five years, or perhaps for the next 15 or 20 years but, on the basis of a priori judgment, a relatively accurate estimate may be made of the general level of weather conditions for the next 50 or 100 years. If this is the case, an empirical evaluation is possible in respect to this longer period of time; a statistical probability exists and the situation is insurable. On the basis of these data, however, the actuarial losses which would be encountered by an insurer should be estimated only in respect to this longer period of time.

For purposes of crop insurance, statistical probability cannot be determined with respect to the individual farmer's yield record in the Plains (1) because his yield record cannot be determined with the desirable degree of accuracy for an adequate period of time, and (2) because changes in a farmer's methods, practices, type of farming, etc., may make the yield probabilities significantly different from the yields existing in the past. Therefore, the type of all-risk crop insurance which has been in operation in the United States is unadapted to the Great Plains in an actuarial sense. Statistical probability may be determined on two other bases in the Plains: (1) long-run yield records for a crop area—such as a county, part of a county, or several counties—and (2) long-run weather records for an area.

In the case of area-yield insurance, a "normal" yield would be developed for each area. Premiums and indemnities would be based on yield probabilities for the area. A farmer in effect would insure a share of the crop in the

area and he would receive an indemnity whenever the area yield was below the level at which he had insured his "share."

In the case of weather-crop insurance, the long-run normal precipitation, humidity, temperature, etc. would be determined for a locality or area. A farmer could insure for a certain percentage of normal weather; i.e., he would receive an indemnity any time the weather in terms of the phenomena selected for the formula was below the standard insured.

The relationship between problem, program, and research is a mutual one, as Horton and Barber have indicated. Research should be directed with the purpose to determine how or in what forms stability devices may be developed. Two processes must be undertaken. One is to think through the contribution which any device or program may make and the other is to assemble the data to determine how it may be adapted. In the case of crop insurance, for example, we should have a clear-cut outline of the purpose of insurance and a carefully reasoned statement as to the various forms which the program might take. Then the degree of income stability and the contribution toward efficient use of resources which can be made through use of insurance would be determined through inspection of models representing the various classes of situations. For this purpose we should obtain much greater detail than we now have on the internal construction of farm cases; especially on the individual yield patterns of farms within selected communities.

Likewise in the case of storage—the functions which storage may perform in the Great Plains should be identified and the type of program outlined which could best serve these functions. To what extent should storage be used toward stabilization of feed supplies and what types of storage facilities and instruments are best adapted? If our progress in attempting to answer questions such as these is disappointing, it may be because we have not thought of storage as a device which may be peculiarly adaptable to the livestock economy of the Plains and as a program which must be related to the yield variability of the Plains if the major function is to be performed.

The crucial question in this type of research is the concept the researcher has of the problem and the adaptation of the programs. The same set of basic data may be made to serve more than one purpose. For instance, the idea of expanding the feeding of wheat is currently under investigation in the Plains region. A pertinent question may be: In addition to data on costs and returns, how stable will be the farmer's supply of wheat? The answer to this is dependent both on the yield variability as well as on the storage program followed. The same data on yield variability may be basic to wheat feeding, storage, and crop insurance. Also yield data by farms over a period of years combined with information on prices and costs should be useful in determining what kind of credit policy a lender should follow.

In this type of yield uncertainty, without such stability devices the individual farmer finds it difficult if not impossible to budget inputs or to arrange the capital structure in a manner which will both maximize his net returns and carry him through a period of low income years. He is forced to compromise between the maximum gain and the minimum loss

and precise answers cannot be made to important questions of farm organization—involving diversification, feeding, storage, size of unit, type of farm, etc. Devices or programs designed to counteract some of the production uncertainty should allow greater precision in plans for farm organization and management. Consequently, much greater progress should be made in research fields dealing with farm organization and management in the Plains if programs counteracting some of the production uncertainty were successfully adapted.

The programs and the types of research are interrelated. The challenge involves (1) a type of research directed toward the development of programs which can contribute both to income stability and to the efficiency of resource utilization, and (2) a type of research directed toward the adaptation of farm units to the environment and to the types of programs which may be developed.

DISCUSSION

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In my opinion, three kinds of research require more emphasis than given to them in the Horton-Barber paper. The first of these is the need to further develop the theory of dynamic farm firms. A certain air of indefiniteness was present in the Horton-Barber paper about how to proceed in studying the roles of physical and financial flexibility and diversification. This indefiniteness indicates a need, on the part of our profession, for a more adequate theory of the firm. The need also showed up in Professor Schickele's paper where the theory available to him was only moderately productive of aids to the family farm. We might further localize this need by stating that a more adequate theory of the decision-making process is required.

Some exploration on my part convinces me that a combination of the statistical theory of sequential analysis with the theory used by Professor Schickele would yield realistic concepts of windfall profits, windfall losses, and more realistic concepts of returns to management, risk and uncertainty. Also, such a combination promises help in understanding the role of physical and financial flexibility in the making of decisions in noncertain situations. Such an understanding might suggest new managerial principles for use by firms facing high yield risks.

There are other possible lines of investigation which might improve the existing theory of the dynamic firm. For instance, Professor Schickele placed heavy emphasis on uncertainty concerning the length of runs of dry and wet years. Perhaps, the statistical techniques for handling probabilities of lengths of runs could be combined with the present theory of the dynamic firm to yield useful results. Might not such a combination help us understand the actions of a Plains farmer who says, "We've had 12 years of good weather in a row—I'm going to get ready for some dry years"?

It seems that most formal statistical techniques have informal counterparts in the decision-making processes of entrepreneurs. Currently, a rapid rate of progress in the field of statistical theory is offering us an unusual opportunity to work new techniques of statistical analysis into the theory of entrepreneurial decision-making.

Until we have a theory which adequately handles the thought processes of entrepreneurs, our understanding of our five to six million farm firms will remain poor. And, it will be especially poor for firms in high risk areas. Our current lack of understanding reduces the efficiency of our research—our empirical research gropes, only partially guided, and we are unable to predict the results of proposed public policies and institutional changes.

Our difficulty in predicting area wide results of public policies reminds us again that we have practically no theory for combining the effects of risk and uncertainty on the actions of individual firms into area wide effects. Both papers presented here today suffer from our profession's inability to supply a conceptual framework for going from the micro to the macro aspects of our *dynamic economy*. This is the second kind of research which requires more emphasis.

I turn now to a consideration of the third kind of needed research into the consequences of using alternative forms of farm production units more extensively. One reason for carefully appraising other kinds of production units as alternative ideals for the Great Plains is the fact that bad weather often adversely affects the welfare of families closely tied to the production unit. Professor Schickele has emphasized that the income level required for the family standard of living is part of the "critical limit of survival" for family-type farms. The question raised here is far from new—by implication, the universal appropriateness of the family farm was questioned in a report entitled, "The Place of the Family Farm in Our Land Tenure System." This report was prepared by Committee I of the Farm Tenure Conference held at Chicago in 1946. It would be appropriate for our profession to carry out an appraisal of the social and private implications of using other types of production units more extensively in high risk areas. For example, what would be the social and private consequences of large-scale corporation farming in areas of high wheat yield risks as compared with family farming? Another question might inquire as to the private and social consequences of more businesses which include both farm and nonfarm branches? Still another question could ask might not human suffering be less, human happiness greater and public costs lower if certain high risk areas were entered once each year for planting and again for harvesting in the years which produce worthwhile crops? These are examples of questions which might be profitably studied before finally settling on the family farm as the ideal production unit for high risk areas.

THE IMPORTANCE OF IRRIGATION IN THE ECONOMY OF THE WEST

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I SHALL discuss the importance of irrigation in the economy of the West from two approaches: first, the extent of irrigation and some of its characteristics in relation to the economy; second, ways in which irrigation is of economic importance to certain groups of people.

By "the West" I shall refer to the 11 Western States, the states in which irrigation is of greatest importance. These states comprise more than a third of the land area of the country, and contain about 85 percent of the irrigated land.

The most recent statistics on irrigation for the West as a whole are somewhat old. In the 1945 Census of Agriculture, data were obtained on the number of irrigated farms and on the acreage irrigated.² For characteristics of irrigated land and data on irrigation enterprises, it is necessary to go back to the 1940 Censuses of Agriculture and Irrigation. Until we take the Seventeenth Decennial Census next year, however, these statistics will be all that we have except for areas where special studies have been made.

I

About one-half of the half-million farms in the West are irrigated in whole or in part. More than half the income of farmers is from irrigated crops and from livestock and livestock products obtained from irrigated crops and pastures.

According to the 1940 Census about 75 percent of the employed persons in all the extractive industries in the West—agriculture, forestry, fisheries, and mining—were employed in agriculture. Presumably about one-half of these, or 35 or 40 percent of the total employed in the extractive industries, were employed in irrigated farming. The proportion of workers in the nonextractive industries and occupations in the West who are supported indirectly by irrigated farming, doubtless is less than the proportion of workers in the extractive industries who are directly employed in it. This is

¹ Responsibility for the opinions and conclusions expressed is entirely the author's.

² *Farm Census Shows Substantial Increase in Irrigated Land*, U. S. Bureau of the Census, processed release, undated.

because some of the other industries—the Hollywood movie industry, for example—are geared to the entire national economy rather than to the economy of the West. It appears, however, that possibly as much as a third of the total population in the West depends on irrigated farming for its livelihood, directly or indirectly.

The irrigated area in the 11 Western States in 1944 was 17.3 million acres. In the remainder of the country only 3.2 million acres were irrigated, of which more than a third were in Texas.

Without irrigation, most of these 17 million acres would be barren desert or low value grazing land. With irrigation, it "blossoms like the rose" and produces crops that had a farm value of over two billion dollars in 1947 according to estimates of the United States Department of Agriculture.³ That was an average value of around \$150 per acre of irrigated cropland harvested, more than double the United States average for nonirrigated cropland harvested.

California has the largest irrigated area of any state, nearly five million acres in 1944, almost a fourth of the entire irrigated acreage in the country. Colorado is second, with 2.7 million acres; and Idaho third, with more than 2.0 million.

In a study of the longterm outlook for western agriculture, Clawson and Calhoun of the Bureau of Agricultural Economics estimated that 72 percent of the cash farm income from crops and 32 percent of the income from livestock and livestock products originated from irrigated land in 1939, and that irrigation produced 54 percent of the combined total income from crops and livestock.⁴ The more recent estimates of value of irrigated crops in 1947 by the United States Department of Agriculture are that 70 percent of the value of all crops in the Pacific Coast States was obtained from irrigated land and 60 percent in the Mountain States.⁵

Irrigation is responsible for the population of the West having more abundant, fresher, and lower priced supplies of fresh vegetables and fruits. Without irrigation much of these products would have to be imported from other parts of the country. Without irrigation practically all dairying in the West would be devoted to

³ *Irrigation Agriculture in the West*, U. S. Department of Agriculture, Miscellaneous Publication No. 670, November 1948, page 3.

⁴ Marion Clawson and Wendell Calhoun, *Longterm Outlook for Western Agriculture*, Bureau of Agricultural Economics, Berkeley, California, June 1946, processed, pp. 49-51.

⁵ *Op. cit.*, *Irrigation Agriculture in the West*, page 3.

market milk production and most other dairy products would have to be imported.

Irrigation bears an important relation to the western livestock industry. More than two-thirds of the entire irrigated acreage is used for producing feed crops and pasture. Dairying is the principal type of livestock production on the irrigated lands, but a large part of the irrigated crops and pasture is used for beef cattle and sheep production. Nearly three-fourths of the total land area in the West is range land, used chiefly for grazing beef cattle and sheep. The West has always produced an important surplus of beef cattle and sheep to supply the needs of the rest of the country. For the past three decades, however, production of range livestock has been declining, as a result of declining productivity of the range.⁶ Increasing production of irrigated feed crops and pastures has offset this declining range production to a considerable extent.

Irrigated feed production also makes possible the fattening and finishing of more beef cattle and sheep in the West to supply the expanding western markets. In the early days most of the range cattle and sheep were shipped east to the cornbelt for feeding. As the population of the West increases, more feeding is needed in the West, which would be impossible without the feed crops produced by irrigation.

The net result of new irrigation development is chiefly more beef cattle and sheep production than would have occurred without the irrigation development. This probably sounds like heresy to some persons, because most new irrigation development is based on anticipated production of fruit, vegetables and other cash crops, and dairying. The point is, that there is already a large acreage of irrigated land in the West now used for feed crops that is suitable for producing fruits, vegetables, and other cash crops, and that can and will be used for such crops as rapidly as the market warrants. Also, whenever the western market for dairy products warrants, use of irrigated feed crops and pasture can and will be shifted from beef cattle and sheep feeding to dairying. With new irrigation development, needed increase in production of the more intensive commodities may occur in the new area instead of in some area where it otherwise would have occurred, or production in the new

⁶ H. E. Selby and Donald T. Griffith, *Livestock Production in Relation to Land Use and Irrigation in the Eleven Western States*, B.A.E. Berkeley, Calif., March 1946, processed, p. 8.

area may even displace production in an older area. But the net result of the new irrigation development is largely more beef cattle and sheep produced in the West than would have been produced without it.

It should be noted, however, that the result of new irrigation development in a local area may be less, rather than more, livestock feed in that particular area. The reason for this is that the additional water supply may make it more profitable to raise sugar beets, beans, or other cash crops on land that was used to produce hay when the water supply was less adequate. Such displacement of feed production by cash crops in a certain area, however, tends to postpone similar displacement that otherwise would occur in some other area.

A most important aspect of irrigation is its stabilizing effect not only in the agricultural economy, but in the entire economy of the West. Irrigated farming is much less subject to hazards of weather than nonirrigated farming. Widespread drouth and resultant failure of nonirrigated crops is therefore not so great a hazard to the total economy as it would be if there were no irrigation. By diversifying farm production irrigation makes the region less subject to business depression.

Irrigation is only one phase of the control and use of water resources in the West. Other important phases are flood control and use for hydroelectric power, navigation, domestic water, and recreation. Most of the larger irrigation developments are multiple-purpose projects, combining irrigation and one or more of the other purposes of water control and development. In many of these projects no single purpose would justify the development, but by combining the several benefits the project becomes feasible. Thus irrigation is a factor in obtaining more complete utilization of water resources, and this in turn makes possible more complete utilization of other resources.

But now, although irrigation provides the means by which a considerable proportion of the population in the West makes its living, does that mean that those people are any better off as a consequence of irrigation? Perhaps they could make just as good as or better livings elsewhere. Who benefits from irrigation? Is anyone worse off as a consequence of irrigation? This brings me to the second part of my discussion, on ways in which irrigation is of economic importance to certain groups of people.

II

I shall discuss very briefly some of the ways in which it seems to me that irrigation is of importance to six groups of people, and then comment on its significance to the general public.

1. *Settlers on irrigation projects.*

Probably most people think of the settlers on irrigation projects as the principal beneficiaries of irrigation. In most cases, however, the amount the settler has to pay for his farm, or for his farm and irrigation construction cost combined, is as much or more than its full economic value for farming. Usually he pays about as much as he would have to pay for a nonirrigated farm of comparable productive capacity. Even on Federal projects subsidized by interest-free money, it is questionable whether the settler gets much benefit from the subsidy, for he is required to pay "all the traffic will bear." A statement sometimes heard in the West is that it takes three crops of settlers to make an irrigation project succeed, and that has been almost the case on some projects.

A fundamental principle of Federal Reclamation policy however, ever since the passage of the original Reclamation Act in 1902, has been to provide family size farms for settlers. The policy also is to give preference to families who have no other means of earning a livelihood, or who have been compelled to abandon other farms through no fault of their own. Doubtless these policies have provided opportunities for farm ownership to many settlers whose only alternatives for employment were as farm tenants or laborers. Many other irrigation farmers have developed their own irrigation facilities through individual or cooperative effort and thus have provided themselves with successful farms and homes, and sometimes they have obtained substantial financial returns. Certainly the early Mormon pioneers in the West owed their settlement possibilities to irrigation. But whether most settlers, on all irrigated lands, have been provided better opportunities by irrigation than they could have found elsewhere, is at least questionable.

2. *Owners of land when it becomes irrigated.*

For this group of people the result of irrigation development varies from large financial gains to large losses. When land is irrigated it enhances considerably in value as a result of its increased

productivity. In some cases, the enhancement in land value considerably exceeds the cost of the development, and represents a substantial financial gain to the landowner. In other cases, the cost of irrigation development exceeds the enhancement in value, and the landowners may lose money, or may default on their payment of the irrigation cost and thus pass on part of the loss to the financiers of the development.

With government development of irrigation one of the problems is to prevent speculative increase in the value of the land to be irrigated from absorbing the ability of the land to pay for the irrigation development. By means of antispeculation laws and regulations, owners of land to be irrigated can be restricted reasonably well from selling the land for more than its appraised value without irrigation. But the ability of the land to pay for the irrigation development often gets capitalized into land value through farm mortgage borrowing. The settlers are able to incur so much mortgage debt that it becomes impossible for them to keep up both their mortgage and their irrigation payments. When that situation becomes general throughout a project, it is usually the irrigation payments that are compromised, even though they may be the prior lien on the land, because public opinion would be too unfavorable toward mass foreclosure of the lands for the irrigation payments.

3. Investors in irrigation development.

In some cases the owners of land to be irrigated are able to finance the cost of the irrigation development themselves, but more often borrowed capital is required. Many individual investors have lost money on unsound irrigation development. Many bonds of irrigation enterprises have sold for a few cents on the dollar, or have become worthless. In a recent study made by the Bureau of Agricultural Economics and the Soil Conservation Service, but not yet published, of about 50 selected irrigation enterprises throughout the West, it was found that the financers of more than a third of the enterprises had lost substantial proportions of their invested capital.

The reason why irrigation enterprises fail financially is almost always that the cost of the development exceeds the value of the increased productivity of the land; that the ability of the land to pay for the development is capitalized into land value before the cost is paid; or, in most cases, a combination of these circumstances.

Financial failure often is ascribed to poor land or to an insufficient water supply. The fundamental cause, however, is the cost of the development relative to the benefits. Relatively poor land can pay for irrigation, and practically any kind of water supply warrants development, if the development cost is low enough.

Financial failure seldom results in abandonment or discontinuance of an irrigation enterprise. Whatever amount the settlers can pay is better than nothing for the creditors. The settlers on the project usually can pay as much or more than could be realized by dispossessing them and getting new settlers. After the financers of the enterprise take their loss and reduce the debt down to the ability of the settlers to pay, the project becomes a "successful" one.

4. People in industries and occupations that serve irrigated farming.

This group is comprised of the people who transport, market and manufacture the products of irrigated farming and those who supply goods and services to the people engaged in irrigated farming. Irrigation development creates opportunities for employment in the vicinity of the development. It creates need for various specialized occupations such as irrigation engineers, builders of irrigation works, manufacturers of irrigation equipment, water right lawyers, public officials who supervise use of water, and even for college professors who teach irrigation, and agricultural economists who study the economic problems of irrigation.

Where the development is in an entirely new area, entirely new opportunities in the service occupations are created. If the area is partly developed and settled at the time of the new irrigation development, increased volume of business is provided for service occupations already there. The person already engaged in the service occupations may or may not benefit from the increased business. If only one railroad serves the area, it is rather sure to receive an increase in its volume of business. But in some lines of business the new development may attract so many competitors to the area that the volume of business available to the existing firms decreases.

5. Owners of land in villages and towns in irrigated areas.

The need for service industries and occupations in connection with irrigation development causes the villages and towns in the

area to grow and the land to increase in value for both business and residential purposes. As a part of the planning for the Bureau of Reclamation's Central Valley Project in California a study was made of relationships over a period of years between the assessed value of farm real estate and that of nonfarm real estate. The study covered the Central Valley and also the Imperial Valley, both predominantly irrigated farming areas. In both areas it was found that for a given amount of increase in the total value of farm real estate, an increase of about 25 percent as much occurred in the total value of nonfarm real estate.⁷

In a few cases a nominal tax has been assessed on nonfarm land in an irrigated area to help pay the cost of the irrigation development. On the whole, though, the owners of such land have received such enhancement in value as a gift. It is quite probable that their gains from increment in land value, in the aggregate, have been greater than the gains from increment in value of the irrigated land over and above the costs of the irrigation development. It is no wonder that chambers of commerce promote irrigation development in their vicinities.

6. People who would have been better off without irrigation.

As the population of the country increases, more food is needed. Irrigation development increases the acreage of land suitable for crop production. This is one way of getting an increased supply of food, but is by no means the only way. The acreage of land suitable for crop production also can be increased by land clearing, drainage, and soil conservation measures; the production of food on presently available cropland can be increased by more intensive farming; and additional food can be imported. If any particular irrigation development had not occurred, most of the increase in food supply that it provides would have been obtained through development of additional land by other means, or else by more intensive production on existing land. Instead of the opportunities for employment provided by irrigation development, opportunities for employment would have been provided by the increased food production elsewhere.

Increases in value of farm land, in volume of business of service

⁷ Cf. my article *Indirect Benefits from Irrigation Development*, Journal of Land and Public Utility Economics, February 1944, p. 50.

industries, and in value of land in villages and towns, more or less comparable to those that occurred in the irrigated area, would have occurred elsewhere. More or less comparable financial gains to those realized from the irrigation development would have accrued to different persons, who were prevented from receiving them by the irrigation development.

Without the irrigation development, the increased farm production and its corollary economic effects might occur in some other part of the country, some other part of the West, some other part of the same state, or even in the same county; or it might occur as a very slight increase diffused throughout many farming areas. If there were no irrigation in the West, the nonirrigated farm land in the West Coast valleys certainly would be at a premium for production of fruits, vegetables, and market milk to supply western markets, and its value would be much higher than it is.

The history of most irrigated areas shows a rather constant increase in intensity of farming—more fruits, vegetables, and other cash crops, or more dairying. This is the result of expanding market demand for these commodities. As more of these higher value commodities are produced, the value of the land increases, because intensity of farming, or value of crops per acre, is the most important determinant of value of irrigated land.⁸ New development of irrigated land may prevent or postpone opportunity for present irrigation farmers to grow more profitable crops and benefit by resultant increase in value of their land.

Increasing farm production by means of new irrigation in periods of surplus crop production increases the quantity of surplus production, and that further depresses farm prices. Even though the crops produced on the new land are not those in surplus supply, they tend to prevent possibilities of diverting land in other areas from use for surplus crops to use for nonsurplus crops. Particularly in times of surplus production, therefore, farmers in other parts of the country look askance at government development of irrigation in the West. There is considerable time lag, however, between the construction of most irrigation projects and the bringing of the land into production. If irrigation construction could be maximized in periods of depression and minimized in periods of prosperity, it not only would bolster employment in the depression periods but also

⁸ Cf. my article *Factors Affecting Value of Land and Water in Irrigated Areas*, Journal of Land and Public Utility Economics, Aug. 1945, p. 253.

would tend to bring in the additional production during the following periods of prosperity when it is needed.

Lastly, we come to consideration of the general public and ways in which irrigation in the West is of economic importance to it. The Federal government is spending a few million dollars a year to subsidize irrigation development through the device of interest-free money. What does the general public get for that expenditure?

As population increases, if additional farm land is not developed the additional food that is needed can be obtained by more intensive farming of present farm land. To obtain the additional production in this way, higher prices for food are necessary to cover the additional inputs of labor, machinery, and fertilizer. The higher prices will apply not only to the additional production, but to the total production of food. But if the additional production of food is obtained by development of additional land, and if the development cost is not too great, the increased production may be obtained at the same costs as present production.

Preventing only a very slight increase in food prices could very easily justify the expenditure of many millions of dollars by the general public for irrigation development. So far as I know, no way has been devised for measuring the relationship between irrigation development and food prices. If my theory is valid that the net result of new irrigation development is chiefly production of beef cattle and sheep, a method of evaluating subsidy of irrigation in terms of prevented rise in cost of food perhaps lies in the relationships of supply and demand to prices of beef cattle and sheep.

Obtaining increased food production by means of irrigation development rather than by more intensive production on existing farm land has the important additional advantage that it increases the total area of cropland and thus adds to the natural resources of the country. This advantage also is difficult to evaluate—in time of war the additional resource may be invaluable.

FEDERAL AID TO IRRIGATION DEVELOPMENT

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THE development of irrigation is a part of the history of agriculture. Modern irrigation in the United States began slightly more than 100 years ago—nearly two decades before enactment of the first homestead law. It was an adjustment to the arid conditions of the West in the face of urgent need for food for an increasing population and winter feeds for expanding livestock industries.

As with other lines of agricultural development, early irrigation was undertaken without benefit of direct Federal aid. Many small irrigation systems were built by individuals or by small partnerships. Conditions in many places, however, required action by larger groups so settlers organized into cooperative or mutual water-ditch companies for constructing and operating irrigation systems. Understandings regarding "water rights" for irrigation purposes became established by usage and over a period of years gradually became formalized into law by statutory enactments and court decisions. Early irrigation associations often based on informal agreements have also been formalized under various state laws into mutual or cooperative irrigation companies, associations, or irrigation districts.

Projects that required simple low-cost construction were sought. The better, more easily developed lands near dependable and readily accessible water supplies were selected for development. As the more favorable sites were occupied, project development became increasingly more difficult and costly. Storage dams, pumping plants, and long canals over difficult terrain increased the cost of later irrigation developments. To assist in financing and operating such irrigation projects, all of the 17 western states have passed irrigation district laws. These differ in detail but irrigation districts set up under state law generally are public or quasi-public corporations having authority to levy assessments against all lands within their boundaries that benefit from district facilities. These districts have proved very useful, particularly in taking over and operating systems built by the Federal Government. However, they have not

* The writer acknowledges with thanks many helpful suggestions received from members of the staff of the Bureau of Reclamation in Washington, D. C., and Boise, Idaho.

commanded financial resources sufficient to construct the more costly projects. A few states, cities, and commercial companies have assisted in irrigation development, but these give little promise of major future contributions except that receipts from water furnished to cities and industries from multiple purpose projects may contribute substantially to payment of construction costs of some projects.

As the nineteenth century drew to a close it became apparent that Federal funds were needed to finance irrigation development if reasonably full utilization of western water resources was to be achieved. As early as 1888, funds were appropriated for the purpose of investigating the extent to which arid regions could be redeemed by irrigation. Two years later an Act provided that patents issued for lands west of the one-hundredth meridian contain right-of-way reservations for ditches or canals constructed by authority of the United States. In 1902 the Federal Government, by passage of the Reclamation Act, entered the field of direct promotion of irrigation. There were then around eight million acres of land under irrigation. By 1945 Federal and private developments had increased this to approximately 19½ million acres. In 1945 Federal works were capable of furnishing water to more than 5,000,000 acres. Slightly over 2,437,000 acres could be furnished a full supply of water from Federal facilities; 521,000 could be furnished a supplemental supply of storage water; and 2,055,000 could be furnished a full or supplemental supply under special contracts. At present, roughly one third of the irrigated acreage is served by individual and partnership enterprises and a third by mutual or cooperative companies. Some 76 percent of the irrigated land in the 17 western states is served by works constructed by private interests, and 13 percent from works constructed by the Federal Government. The remaining 11 percent is served by both Federal and private works.¹

From 1945 to 1948 acreage served by the Federal projects increased approximately nine percent. Future development of large irrigation projects is likely to be mainly in the hands of the Federal Government, although significant acreages may yet be brought under irrigation by individual enterprises through pumping from farm wells or neighboring streams and ponds and by construction of small farm reservoirs.

¹ *Irrigation Agriculture in the West.* U.S.D.A. Misc. Publication No. 670.

When the Reclamation Act was passed in 1902, it apparently was expected that with modest financial assistance from the Federal Government, reclamation would pay its own way. According to a Fact Finders Committee, appointed by Secretary of the Interior Hubert Work in 1923 to make a comprehensive review and appraisal of the first two decades of Federal reclamation experience, it was initially contemplated that money used by the Reclamation Service for reclaiming arid and semi-arid lands by irrigation should not be raised by taxation. Construction funds were to be derived from the sale of public lands in the states to be benefited, to which were added later such moneys as are derived from royalties from oil and potash lands.² Receipts from extractive resource-depleting industries were thus to provide funds for the construction of relatively permanent continuous-income-producing irrigation works. It was intended that this fund should not be lost but should be held in trust as a revolving fund, and reinvested in the reclamation of arid land as fast as paid back.

The Reclamation Fund, however, proved to be inadequate. Net construction cost of projects subject to repayment, as of June 30, 1923 already was, in round numbers, \$143,000,000. This large construction program had exhausted the Reclamation Fund and made necessary a loan of \$20,000,000 to keep the work moving. Such loans also proved inadequate. Direct appropriations have provided most of the construction funds of the Bureau of Reclamation. Total accretions to the Reclamation Fund, as of June 30, 1948 were approximately \$250,000,000, whereas total allotments and appropriations for reclamation purposes had reached a total of around \$1,530,000,000.³ Appropriations for construction purposes to the Bureau of Reclamation for fiscal 1949 were around \$240,000,000. A Bureau of Reclamation program calls for expenditures of \$3,891,900,000 during the 7-year period beginning with fiscal 1948.⁴

With respect to repayment of irrigation costs Congress has steadfastly maintained its original position that costs assigned to irrigation works, including investigation and engineering, should be repaid to the United States. It has, however, liberalized its re-

² Senate Document No. 92, 68th Congress, 1st Session.

³ Annual report of the Secretary of the Interior, 1948.

⁴ The Reclamation Program, 1948-54, U. S. Dept. of Interior, Bureau of Reclamation.

payment requirements, and increased its legislative safeguards to sound development in several important respects. Terms of payment have become more and more lenient, the sources from which payment can be drawn have been broadened, more thorough investigations have been stipulated, the advantages of multiple purpose projects have been recognized and the allocation of joint costs to their several purposes has been authorized.

With regard to payments, the Act of 1902 authorized the Secretary of the Interior to determine the charges per acre of land with a view to returning to the reclamation fund, in not to exceed 10 annual installments and without interest, the estimated cost of constructing the project.⁵

Before many years, however, a considerable number of projects had failed to meet the schedule of construction charges set up under the 1902 Act. In 1914 all accrued charges were placed in the construction fund and a new start was made under a 20-year repayment plan.⁶ Extension of the repayment period helped, but did not solve the delinquency problem. A few years after the close of World War I many contracts were again seriously in arrears. Congress then provided that all construction charges should be payable in annual installments based on the productive power of the land. The period of payment under this plan was indefinite but originally it was expected to run not more than 40 years. Determination of gross value of crops led to disputes and administrative difficulties, and provision for such contracts was repealed in 1926, but twenty of the irrigation districts which entered into this type of contract with the United States were still paying on this basis in 1947. The Act of 1926 authorized the Secretary of the Interior, upon request of individual waterusers or districts,⁷ to amend any existing water-right contract so as to increase the period for repayment of construction charges not to exceed 40 years from the date of the first payment under the original contract and also to make new contracts with up to 40-year repayment periods.⁸ The 40-year repay-

⁵ The Reclamation Act, Section 4.

⁶ Reclamation Extension Act, Section 2.

⁷ Contracts for payment of irrigation construction charges during the early period were made with individual land owners and homesteaders. Such contracts are still in force on a few projects, but by the Act of May 15, 1922, contracts with regularly organized irrigation districts were authorized. Since then contracts with organized irrigation districts rather than with individual landowners have become the general practice.

⁸ Sections 45 and 46 Omnibus Adjustment Act, 1926.

ment period is still in force but repayment has been modified in other ways which in effect lengthen the repayment period.

The Reclamation Act of 1939 provides for a development period of not to exceed 10 years before the beginning of the 40-year repayment period, thus extending the period of interest-free money to 50 years.⁹ Moratoria granted under special acts during depressions have increased the average contract life by approximately 10 years, according to a recent report by the Bureau of Reclamation.¹⁰

The Reclamation Act of 1939 also permits construction costs to be separated into two parts; (1) those incurred to provide facilities for furnishing the water supply—the main dams, reservoirs, pumping plants and carriage canals; and (2) those incurred for the water distribution system—secondary canals and laterals. Costs of the distribution system are to be paid for under the regular 40-year plan after a development period of not more than 10 years. With regard to water supply features, the Act authorizes water rental contracts with charges sufficient to cover annual operation and maintenance costs of the water supply works, plus a payment on construction costs to be determined by the Secretary of the Interior. These contracts may be short or long, but they may not exceed 40 years. At the expiration date new contracts presumably would be negotiated. Water users or irrigation districts establish no definite water rights under water rental contracts, whereas under repayment contracts permanent water rights are established.

Long repayment periods have been criticized on the grounds that they prevent farmers from accumulating equities in their farms. If construction payments drained off the total surplus above current operating and living expenses, this would be true. The Government, however, has demonstrated neither the ability nor the desire to do this. In determining the waterusers' ability to pay under re-

⁹ Section 7(b) Reclamation Project Act, 1939.

¹⁰ *How Reclamation Pays*, U. S. Dept. of Interior, Bur. of Reclamation, 1947. This publication reports that at the end of 1946 the repayment periods for 66 projects or major divisions of projects involving 177 contracts were distributed as follows:

Number of projects or major divisions	Repayment period (Years)
15	26-39
26	40-49
12	50-64
6	65-79
4	80-99
3	100-150

negotiated contracts, a reasonable return on investment, including normal land values, is included in current operating expenses. This provides a source of savings or capital accumulations for the owner-operator. It is not uncommon for land values to be maintained on projects which are in arrears on the payment of construction charges. Delinquency on water charges, therefore, is by no means conclusive proof of financial distress on the part of the water-users.

Delinquencies on construction charges are not large. The total due to June 30, 1948, was \$84,659,231.71, of which only \$2,369,020.66 (three percent) was unpaid. Delinquencies are kept relatively low, in part, through renegotiation of contracts with projects which are in arrears. Amendatory contracts are being made for projects which now have substantial uncollected items. One aspect of present negotiations is the reduction of annual installments through extension of the repayment period without reduction in the total obligation to be paid.¹¹ The usual reason given for default in payment is that the annual charges are in excess of the district's ability to pay. However, in some cases, there probably is an appreciable element of unwillingness as well as inability to pay. Undesirable features of contracts also may have contributed to delinquency. Virtually all of the earlier contracts provided for fixed annual payments without regard to fluctuation in economic conditions or to changes in the waterusers' ability to pay. Some projects were assessed on substantially more acres than were irrigated, others were authorized under 40-year repayment law with the informal understanding that the ability to repay in 40 years should be thoroughly reviewed before construction payments started.

Contracts are now renegotiated on the basis of detailed investigations by the Bureau of Reclamation regarding the district's ability to pay both operation and maintenance costs and construction charges under expected future average conditions. These contracts usually contain some formulae for adjusting the annual installment

¹¹ An exception is a recent contract on the Tucumcari project which writes off construction charges in excess of the estimated amount that can be collected over a 40-year period. Congress also has written off all the construction charges for five small reclamation projects (approximately \$8,825,000). Four of these were started in the early years in advance of adequate investigations and under pressure. Some-what more than \$14,000,000 has been written off other projects primarily because of reclassification of land and the suspension of the poorer lands from paying status. Although some adjustments stemmed from the depression of the thirties which also caused substantial adjustments in other kinds of agricultural debts.

on construction charges in accordance with changes which may occur in farmers' dollar income and in the purchasing power of this income. Increased attention also has been given to the effect of differences in soils, topography, climate, markets, and other factors on the waterusers' ability to pay construction charges. Some recent contracts, such as those with the Columbia Basin Districts, allow for full recognition of these factors. These contracts specify differential construction payments. During the 10-year development period, water rental charges in Columbia Basin are to be graduated in accordance with the estimated productivity of various grades of land to produce net income under average management.

The desirability of adequate investigation prior to construction of projects was emphasized by the Fact Finders who stated that "success can come to future Federal Reclamation ventures only if projects are authorized upon a thoroughly scientific consideration of the probable power of the project to enable the farmer to repay construction costs and to win a living from irrigated lands. Community and political demand to secure projects," they said, "should be considered only after full knowledge of the feasibility of a proposed project has been secured."

Congress, in 1924, declared that no new project or new division of a project shall be approved for construction until detailed information is secured concerning the water supply, the engineering features, the cost of construction, land prices, and the probable cost of development, and until a finding is made in writing that it is feasible, that it is adaptable for actual settlement and farm homes, and that it will probably return the cost thereof to the United States.¹²

A showing of feasibility and of probable return of costs to the United States had become increasingly more difficult: (1) because new developments have had to turn to more difficult and costly projects as the lower cost and more advantageously located sites became utilized; (2) because great and disproportionate increases in construction and development costs have occurred; (3) because thorough investigation itself costs something but especially because such investigations by close examination often disclose additional obstacles to be overcome which involve increased costs. Detailed land classification, for example, usually eliminates some land which would be classed as irrigable in a reconnaissance survey.

¹² Subsection B, Section 4, Second Deficiency Act, 1924 (Fact Finders' Act).

In supporting their recommendations for sound policies and full investigation before approval of projects, the Fact Finders noted that in many cases the cost of works built by the Government was more than \$100 per acre. They quoted the testimony of the Chief Engineer of the Bureau of Reclamation to the effect that he knew of no new project where water could be provided at less than \$100 an acre. They also observed, as has often been done since, that "construction costs are in almost every instance larger, in some cases several times larger, than original estimates."

On the Columbia Basin Project the present estimated construction cost of irrigation works, including irrigation's share of the Grand Coulee Dam and reservoir is approximately \$410 per acre of irrigable land.¹³ Very preliminary estimates for the Missouri River Basin Project indicate an average cost of around \$400 per acre for the project as a whole. Cost varies widely among units of the project. For California's Central Valley, approximately \$253,000,-000 of construction costs are allocated to irrigation. The project, as presently authorized, will provide a full water supply to 542,000 acres and a supplemental supply to 510,000 acres. Assuming supplemental water supply at half of the full supply, this would be equivalent to a full water supply for approximately 800,000 acres at a cost of around \$300 per acre.

Water users generally are reluctant to obligate themselves to repay such high costs even though payment is over long periods and without interest. Often it would not be to their economic advantage. Ways of relieving waterusers from the full burden of construction costs have been sought in various directions. Four states—Colorado, New Mexico, Nebraska and North Dakota—have legislation providing for organization of Conservancy Districts authorized to levy and collect property taxes. Levies are made in proportion to the estimated benefits accruing to the property from irrigation developments. The most fruitful means of lowering waterusers' obligations thus far devised, however, is to use power revenues to help pay for irrigation works.

The law requires rates for Federal power to be at least sufficient to cover current operating expenses, plus not less than three percent annual interest on the unretired investment in power facilities, plus such fixed charges as the Secretary of the Interior deems

¹³ On the assumption that 1,029,000 acres will eventually be brought under irrigation, and exclusive of irrigation's portion of \$191,000,000 unallocated costs.

proper. It is the policy of the Department to set these fixed charges so that power construction costs will be returned in not less than 50 years. The interest component on the power construction costs is applied to help retire the cost of irrigation works on a number of projects. If prospective rates and sales of power are such that revenues will be more than sufficient to pay operating costs and interest, and to retire construction costs in 50 years, the surplus revenue from power may be applied to repayment of irrigation costs.

On the Columbia Basin Project, for example, it is estimated that at two mills per kilowatt hour, power revenues will result in large surplus revenues that are to be used to retire irrigation construction costs. The \$410 irrigation cost per acre is expected to be retired roughly as follows: interest component on construction costs, 20 percent; surplus power revenue, 60 percent; and water users, 20 percent. The portion of irrigation construction cost which is to be repaid by water users on the Central Valley Project is around 22 percent—on the Missouri River Basin Project around 23.

The use of power revenues to retire part of the irrigation construction costs has been authorized only for individual projects which have both power and irrigation features. These include some very large projects. There are, however, potential irrigation projects on which no opportunities for surplus revenue-producing power facilities occur. The Columbia River Basin Project report states that many irrigation projects awaiting development in the Basin have no opportunities for power production directly associated with them. Without the assistance of power revenues the report finds that these irrigation projects cannot pay the reimbursable costs. By contrast, however, potential main-stem power development will have repayment capacities far above their reimbursable costs. The report argues for authorization to pool surplus power revenues to help pay irrigation costs on any irrigation project or feature where needed in the entire Columbia River Valley. This authority would appreciably increase the number of irrigation projects which could meet feasibility and repayment requirements because large power revenues would be available to cover high-cost irrigation works.

Substantial aid to findings of feasibility and repayment of reimbursable costs has been achieved by Congressional broadening of nonreimbursable benefits from multiple purpose projects. Present

national policy is to require that construction costs allocated to irrigation, municipal, and industrial water and to power be repaid, whereas costs allocated to flood control, navigation, and fish and wildlife conservation are not. By national policy these latter items are recognized as "public benefits" and therefore are nonreimbursable, although a fully satisfactory explanation as to why benefits from keeping excess water off a river bottom farm are public benefits and therefore wholly nonreimbursable, whereas the benefits from taking surplus water to an arid bench farm are private benefits and therefore wholly reimbursable, has never been brought to my attention.

Bills are now before Congress which, if passed, will recognize additional purposes as nonreimbursable items under multiple-purpose projects. These include salinity control, sediment control, recreation, improvement of public transportation, and promotion of national defense. It is proposed that these measures be adopted not only to improve the feasibility and repayment prospects of projects not yet authorized, but also to reduce the repayment burden on water users and power revenues on projects already built or now under construction.

That the water user is not the sole recipient of benefits from irrigation development is receiving ever wider recognition. Persons engaged in servicing, processing, merchandising, transportation industries, and other pursuits within the immediate area and also in other parts of the country frequently are directly benefited. Various indirect benefits are nation-wide. Methods by which direct payments on irrigation costs might be obtained from beneficiaries other than water users have been sought without great success. Conservancy districts have helped to a limited extent. Power users may contribute indirectly if the use of power revenues to pay irrigation construction costs results in higher power rates than otherwise would have been charged. Present efforts to spread costs widely and thus lighten the allocation to irrigation are in the direction of placing a larger portion of costs in nonreimbursable categories. The legislative trend appears to be heading in the direction: (1) of using power revenues to repay costs of irrigation works; (2) reducing construction costs allocated to irrigation or placing them in the nonreimbursable class and (3) of finding irrigation feasible if there is reasonable assurance that farmers on the least productive irrigable lands will be able to pay average operat-

ing and maintenance expenses, once the irrigation works are constructed.

How much Federal subsidy should go into the building of irrigation works? A sound appraisal of this problem becomes increasingly urgent with mounting construction cost per acre of irrigable land as more difficult projects are undertaken, with relatively lower net benefits per acre as irrigation is extended to less promising localities, and with reduction in the proportion of the cost to be repaid by waterusers. The insistence of local pressure groups for project construction increases as payment allocations to local groups diminish.

The question of how much public investment should go into irrigation works does not lend itself to a direct or simple answer. Its answer is related to those of numerous other questions concerning national policy. How much of the national income should be spent by the Federal Government? How much of this should be used for the conservation and development of resources? How do prospective returns or contributions to national well-being from investment in irrigation works compare with those from investment in other lines—in development of metals, ores and minerals, in power facilities, roads, research, education, health, and wildlife conservation? Public and private benefits flow from all of these programs. All may be proper functions of Government, but all cannot be supported to the degree their more ardent advocates desire.

There is need for a well-rounded forward-looking national program of resource development and conservation. Construction and development of each part of this program should be geared to immediate and long-time national needs, to Government fiscal policy, and to general economic conditions. Contributions of each to the national welfare should be evaluated in terms of broad economic and social objectives. Irrigation development in my opinion, should have an important role in such a program.

ACREAGE LIMITATION IN FEDERAL IRRIGATION PROJECTS WITH PARTICULAR REFERENCE TO THE CENTRAL VALLEY PROJECT OF CALIFORNIA

VARDEN FULLER

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FOR the past several years the acreage limitation feature of federal reclamation law has been in controversy in the Central Valley Project of California. The issue arises primarily because this project deals with privately-owned lands, a good portion of which is already developed under irrigation and is in large ownerships and large operating farms. The project is needed to supplement presently inadequate water supplies and to integrate the uses of the water resources of the entire Central Valley Basin. No acreage limitation was contained in the state legislation of 1933 which originally authorized the project. But the state did not build the project; rather, the assistance of the federal government was sought and in 1935 it was authorized as a federal project subject to reclamation law. Since the people of the state had had little previous experience with federal reclamation, they had little reason to be well acquainted with reclamation law. Only in 1943 and 1944, when construction was well advanced, did landowners become generally aware of the acreage limitation. In the first several years following the initiation of the project, the Bureau of Reclamation, although it clearly should have done so, made no attempt to contract its prospective water supplies nor forthrightly and officially to inform the people of California that all provisions of federal reclamation law were applicable.

Much of the discussion as to the applicability and merits of the acreage limitation within the state and in Congress has been highly controversial. Prominent persons and organizations are lined up on one side or the other.¹ Unfortunately, the controversial atmosphere has obscured some all-important and fundamental problems and has delayed study and consideration of them. Inevitably, both proponents and opponents of the acreage limitation have had to assume extreme positions. It may perhaps truthfully be said that the acreage limitation as it now stands has neither the virtues

¹ For an excellent discussion of the political issues and the positions of parties in respect to them, see Taylor, Paul S., "Central Valley Project: Water and Land," *The Western Political Quarterly*, University of Utah, vol. 2, no. 2, June 1949.

that its supporters ascribe to it, nor the diabolical attributes that its foes ascribe to it.

Purposes of Acreage Limitation

The quarter section (160 acres) has long been a prominent feature in American land policy. Under the Pre-emption Act of 1841, an applicant could file a claim within the limit of 160 acres if he were the head of a family, or a man over twenty-one years, or a widow, but such applicant had to swear that he had no more than 320 acres of other land. Under the Homestead Act of 1862, any single person over twenty-one years, or any person who was the head of a family could acquire title to 160 acres of public land provided he met the residence and improvement requirements. These basic 160-acre limitation features were carried forward into the Reclamation Act of 1902, with the additional power conferred upon the Secretary of the Interior to adjust the limit in an ownership that would be eligible to receive federal irrigation water between the maximum of 160 acres and a minimum of 40 acres. Such a limit was to "represent the acreage which, in the opinion of the Secretary, may be reasonably required for the support of a family upon the lands in question . . ." (Sec. 4 of the Act of 1902). Thus, it appears that the framers of reclamation law intended not only to carry forward the maximum ownership concepts of the Pre-emption and Homestead acts but also to introduce further limitations to reflect differential productivities of land and the value of federally developed irrigation water—these considerations being further equated to the income needs of a family.

In irrigation law and philosophy, the acreage limitation has been expected to serve the dual and mutually consistent purposes of being a formula for the broad distribution of publicly financed benefits and an instrument of achieving family-owned and operated farms. It has been and continues to be expected that the ownership unit and the farm operational unit are one and the same thing, and that the owner will be the operator of his unit and no other. But apart from the determining of income needs and the unit to meet them, there are several problems here: one is in the aggregation of individuals that may constitute the family; another lies in the question of whether the owner will work his land or lease it to another; still others lie in the disposal of privately-owned lands in excess of the eligible acreage.

The basic reclamation statute is now almost a half century old. It has been amended and supplemented at least a dozen times in general legislation and additionally in legislation specific to individual projects. The vast detail of 47 years of legislative, administrative, and judicial experience incorporating the adaptations and concessions made in particular projects contains both affirmation of and divergence from apparent original legislative intent. Although acreage limitation as a general proposition has remained intact, many details as to its application have been changed both legislatively and administratively. As a result, the sort of farm unit now eligible to receive federal irrigation water differs materially from the unit as originally contemplated.

In summarizing the characteristics of the eligible irrigation unit as they were first conceived and in comparison with the provisions and administrative interpretations of current law, the contrasts are as follows:

Ownership Unit: Originally, as under the Pre-emption and Homestead acts, it was essentially a family concept with the rights resting in the head of the family or in a person over twenty-one years having the prospect of becoming the head of a family or a spouse of the head; the individual had to be a real person. Now the ownership unit is any person, without regard to family status, male or female, of any age, real or corporate.

Acreage Eligibility per Ownership Unit: Originally, based upon determination of the Secretary of the Interior of the amount of land needed to meet the income needs of the family, the acreage per ownership unit was set between 40 acres and 160 acres. Now, eligibility is 160 acres for any individual ownership, without regard to the productivity of the land or the income needs of the ownership unit.

Occupancy and Operation: Originally, the individual holding the water right was required to occupy the irrigation unit and live thereon or within a fifty-mile radius. Now, there are no residence or occupancy conditions whatever.

Disposition of Excess Land: In the early administration of the law, water was delivered only to units small enough in total to meet the eligibility requirements. This meant that if a holding was too large, the excess land had to be disposed of before water was supplied to the nonexcess. Now, any individual owner is entitled to water for 160 acres even though he may own 10,000 acres within a

project. Furthermore, water may be received on the entirety of an ownership, irrespective of how big it is, for ten years provided the owner enters into a contract agreeing to dispose of the excess within or at the end of the ten-year period.

With the changes that have occurred as to ownership, occupancy, and the disposal or nondisposal of excess land, it is quite apparent that the operating farm unit may differ very greatly from the irrigation eligibility unit. The operating unit may now include the irrigation acreage limit of each of any number of individuals holding fractional interests in co-tenancy plus excess lands either with or without project water plus any number of absentee ownerships that may be rented and brought into the operational unit.

The maximum divergence between original objective and possibilities under current reclamation law has not been manifest in other projects. Partly, this is for the reason that many of these projects were initiated under earlier law; partly, it is because several of them are covered by more restrictive legislation specific to the project. But more important, most of the projects are located within areas where the scale and type of farming is more nearly in accordance with the characteristics of the traditional family farm than is the case for much of the prospective irrigation service area in California. Here, the many large ownership and operating units already developed into intensively cultivated irrigation farms will quite obviously be subjected only to the minimum accommodation to the acreage limitation that is required under the law. Reciprocally, therefore, the widest divergences from original intent will undoubtedly come to be seen in the application of the limitation in the Central Valley Project.

Application of the Acreage Limitation to the Central Valley Project

The possibilities of setting up operational units much larger than the individual irrigation limit of 160 acres were described above. To what extent will owners and operators in the Central Valley area take advantage of these possibilities? This question obviously cannot be answered in advance but practices of the past should give some indication of the general characteristics of the situation that will come to prevail in the future.

Practices established in the past are indicated by a survey made in 1945 by Edwin Wilson and Marion Clawson, then of the Bureau of Agricultural Economics, of the interrelationships between

ownerships and operating units in the valley floor area of Madera, Tulare, and Kern counties,² which is the principal prospective water service area. The data were derived from AAA records which relate to the year 1940. This survey covered a total of 10,436 farm operating units for which the corresponding number of ownership units was 12,941, or an over-all ratio of $1\frac{1}{4}$ ownership units per operating unit. On one half of the ownership units, ownership and operation were perfectly concurrent, i.e., the owner farmed his own unit, renting no land to or from others. Tenants operating the entirety of an ownership but owning or renting no other land accounted for another 10 percent of the ownership units. Thus, a total of 60 percent of all ownership units was also the operating unit. But these arrangements were heavily confined to the smaller ownerships and, therefore, accounted for only a small fraction of the total land in farms.

With ownerships above 320 acres, the extent of identity between the ownership and the operating unit declines as size increases. From around 640 acres and up, the evidence is that owners become more concerned with renting than with operation.

Of all land in the operating units above 640 acres but less than 5,120 acres, more than half is rented. From 640 acres to 1,280 acres in operating farms, 57 percent is rented land; from 2,560 to 5,120 acres, 66 percent is rented, but the very large operating units over 5,120 acres are based primarily on owned land.³

The study included fifty-one farms which operated between 2,560 and 5,120 acres, of which only ten were based upon a single ownership, twenty-six were operating from two to ten ownership units and fifteen were operating more than ten ownership units.⁴

If, in the future, the practices of the past as revealed by the study of Wilson and Clawson are continued, the operational unit receiving federal water may quite well be several times the individual ownership limit. A community ownership of 320 acres, if added to by leasing land in the same ratio as now prevails for this size group, can be built into an average operatorship of approximately 600 acres. A unit combining the individual ownerships of a man and wife and two children and adding the average ratio of

² U. S. Bureau of Agricultural Economics. *Agricultural Land Ownership and Operation in the Southern San Joaquin Valley*. Berkeley, 1945. 100 p. Processed.

³ *Agricultural Land Ownership and Operation in the Southern San Joaquin Valley*, op. cit., p. 71.

⁴ *Ibid.*, p. 72.

rented land applicable to this size group could be built into an average operatorship of approximately 1,500 acres.

The practice of using rented land from several ownerships to build up large operating units is thus well established in this area. Beyond the possibility of combining ownerships, there are the additional opportunities of continuing to operate the excess acreage without project water or of operating the entire acreage for ten years with project water, received under a recordable contract. The combined effect of these possibilities of operating farms far in excess of the individual acreage eligibility cannot be forecast at this time. There seems to be no good reason why multiple leasing will not continue under federal irrigation, but the extent to which excess acreage will be kept in the operating unit, either with or without water, cannot at present be known. This is because only a small proportion of the total water supply is presently under contract and until all water is contracted, the project service areas will not be known, and until the project service areas are known, the amount of excess land cannot be known. Furthermore, whether the holders of excess land will want to operate it without water or will sell without having established water right, or will apply for project water under the recordable contract are decisions they will probably defer until the change in ground water levels and the assessment practices of the districts with respect to acreages not under service are known or can reasonably be forecast.

Although there are factors yet undeterminable that will influence the effect that acreage limitation may have on the size of operating units, there is little prospect that operating units will be restricted to anything like the individual irrigation limit of 160 acres. Apparently, there will be considerable opportunity to maintain federally-irrigated operating units of from 320 to 1,000 acres without much difficulty. Adding to that such excess lands as may be permanently retained without project water further increases the operating unit. It seems most doubtful, therefore, that the acreage limitation as such will contribute significantly towards the expansion of family-size farm units in the Central Valley Project area.

Conclusions

- (1) Present law on acreage limitation—while being in broad terms the result of affirmation and reaffirmation, legislatively and administratively, of the initial act of 1902—now diverges in details

of such importance as to impair the realization of the objectives originally hoped for.

(2) At least in projects where private ownerships are large or other conditions are favorable to large-scale farming, the basic law cannot be expected to serve as a means of achieving family owned and operated farms. This does not mean, however, that supplemental legislation for specific projects prepared in advance of construction cannot be the means of realizing this objective.

(3) As long as tax-supported federal irrigation activity involves subsidy and originates benefits that are privately realizable by only a very minor proportion of the population, some sort of formula for the equitable distribution of such benefits is clearly needed. Although the per-capita benefit that can be realized has unquestionably been greatly increased during the past forty-seven years of legislative and administrative experience, and eligibility has shifted from the little fellow to a per-capita basis, the acreage limitation still stands as a formula for the broad distribution of benefits. For the Central Valley Project, the diffusion of benefits will apparently be realized less in terms of expanded opportunities to own and operate farms than in terms of opportunity to acquire and retain land on a rentier basis.

DISCUSSION

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Dr. Fuller's paper comprises a good statement of the operation of land tenure under the acreage limitation clauses in the Reclamation Act of 1902 and as subsequently modified. The purpose of federal irrigation activity as given by Dr. Fuller is subject to question. He stated the "primary purpose" of this activity "is to create farm homes on which the owning family will live and work and earn an acceptable income." This is a sociological objective. Back of the sociological objective and even more fundamental must be an economic objective: the creation of additional wealth-producing properties. Why should not consideration be given to an ownership or operation pattern that will bring most production or most wealth to America? Such a pattern would ensure earliest repayment.

In another part of his paper Dr. Fuller states ". . . that while federal irrigation law is now stripped entirely of the concepts of a family holding and an economic unit capable of providing a family income, the legislation for specific projects . . . may contain limitations incorporating both ideas." The reader should note that the so-called minimum economic unit to which reference is made is "economic" only in the mind of a sociologist. A minimum economic unit more sound from the standpoint of society comprises that sized farm which will keep the operator fully occupied, or in other words which will utilize the full physical and managerial capacity of the operator. Incidentally, this latter minimum unit is the more readily determinable

and it is this unit which is becoming larger as mechanization and specialization develop.

In his closing remarks Dr. Fuller implied that the acreage limitation through its control on sales prices of excess land may reduce "speculation based upon the unearned irrigation value increment." It appears, however, that unless land is appraised and acquired by government before irrigation development is started, the original owners of the land, both large and small, will be the recipients of the largest unearned increment of value because of the enhancement of value before sale.

Mr. Selby in his paper has challenged the importance of irrigation in the economy of the West. His most extreme statement minimizing the value of irrigation follows: "the net result of additional irrigation development is chiefly more production of beef cattle and sheep than otherwise would occur." While it is conceded that irrigation development has made possible certain increase in the poundage and in the finishing of livestock produced in the West, to attempt to convert the net result of additional irrigation to pounds of beef and sheep is certainly a great simplification of the vast irrigation development that has occurred in the West.

Actually, in the twenty years ending with the year 1940 during which irrigation expanded widely, sheep numbers by census count decreased six percent in the eleven western states and numbers of beef cattle decreased 15 percent. It is not logical to take a matter like irrigation development entirely out of its setting. Irrigation development must be considered as a part of the development of the West. Here a new empire has been created. The same initiative, energy and capital that built the cities of Los Angeles and Seattle, that built the San Francisco Bay bridges, that built Grand Coulee, Bonneville, and Hoover dams, that developed the copper mines of Arizona, the coal of Utah, the ferrous and gold mines of Colorado, also built the irrigation works, leveled the land, and made the desert blossom with something other than cacti.

True, there might still be an America without Bonneville, without Los Angeles, without the Bay bridges, without the pleasure highways of the West. America in 1949 could import its copper from Mexico and South America. It might get its fruits and vegetables from Central America. For the love of nature its people might travel the highways of France and Italy and Switzerland. Under such conditions the production and industries of the West would not be competing with the production and industries of the eastern states—but that America would not be the world-dominating America we know at the midpoint of this twentieth century.

DISCUSSION

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The typical Midwestern attitude toward the increasingly costly reclamation projects in the West can be, I think, summarized in a few words. The attitude is changing. Typically, the people of the Midwest and the East believe in the conservation and development of our national resources including water. However, they have been familiar only in a general way with the scope, benefits, and costs of western reclamation projects. Frankly, they have been rather apathetic toward the entire question of irrigation of

western lands. Moreover many of them have sort of had the feeling that many of the products of irrigated lands in the West were supplementary to the staple agricultural products of the Corn Belt, such as out of season fruits and vegetables which move East in great volume.

Two recent developments are changing the typical attitude of the Midwest and the East toward further irrigation at federal expense. First the increasing federal tax burden paid by all of us, including Midwestern farmers, is causing many people to take a second look at large items of federal expenditure, especially where no direct benefits accrue to the person so aroused. The second development, which is upon us now, will really arouse a flood of protests in a year or so. Our farmers and our farm leaders, and a few college personnel also, will not welcome curtailment of output by government fiat in an area of natural production where water comes free, while at the same time they are being taxed to expand output in unnatural and high cost areas. And these Midwestern farmers will be further aroused when they discover that the net effect of much of the new irrigation in the West will be to increase output of competitive products such as livestock and dairy, as Mr. Selby pointed out in his paper.

The Midwest, or any other section for that matter, has no quarrel with reclamation that pays a reasonable share of its way. After all, all sections of the country have had, and now have, considerable government enterprise of this nature. This was a basic principle of the original Reclamation Act of 1902. However, when reclamation becomes an end in itself, on projects that are obviously marginal, to state it generously, from a cost analysis point of view, then we need a new look at the entire process.

We have moved a long way from the subsidy provided in the Act of 1902, namely that project costs were made repayable without interest charges, to the philosophy currently held by many proponents of reclamation that an irrigation project is feasible if there is reasonable assurance that water users will be able to pay annual operating and maintenance expenses, with no charge for construction, as pointed out by Mr. Fuhriman.

It is deplorable that we tend to allocate an ever increasing share of irrigation costs against such non-reimbursable items as flood control, recreation, wild life and game development, and the like, in order to justify another irrigation construction project. This type of subterfuge is usually not in the long time public interest, if it results in uneconomical expenditure of public funds and an unnatural allocation of our production resources in agriculture. If we are going to curtail output of food and fiber in our natural and low cost producing areas, then we should not at the same time resort to a form of public deception in an unrealistic cost allocation to justify huge federal expenditures in additional irrigation projects.

Let's be realistic. If the nation faces an actual food shortage, then by all means let us pursue aggressive programs to reclaim new areas, even at considerable federal expense. But if we are going to act like we already have too much food (and that's the way it looks now), then let us produce our needs as economically as possible, wherever we can.

Let's be consistent. Let's not make reclamation an end in itself, particularly in cases that are clearly marginal or submarginal, but let's make the agricultural part of our reclamation program subordinate to the overall food and agricultural policy of the nation.

WESTERN RANGE LAND USE AND CONSERVATION PROBLEMS

MONT H. SAUNDERSON

U. S. Forest Service

SUPPOSEDLY, now is a time when conservationists are seeing "bogey men" under beds and in dark closets. I'm not going to ask you to peer into such places with me, but I do want to draw a word picture of certain trends in the western range resources, to discuss the economic factors in those trends, and to relate those trends to some significant changes in the operation and management of western stock ranches.

In the general picture, the western range is a declining resource. So definitely is this true that some parts of it can be written off, as having passed or as rapidly passing the point of feasible rehabilitation. This decline is evidenced at the one extreme by rapid and violent erosional destruction of range land and soils; at the other extreme by shifts in the native plant associations to a somewhat lower, though not necessarily less valuable, range plant ecology. In between these extremes we see some widespread displacements of native range plants by exotic range plants that are much less useful as range forage and as soil and moisture conservers. We see some significantly undesirable shifts in the native range plant life of some large range areas.

Some deny these important changes and say that we have not any appreciable decline in the western range resources. Those who express this belief point to the long run uptrend in our western population of range and pasture animals, to the trend of increased calf and lamb crops and higher weights of market animals, to the higher number of animals marketed in ratio to the stock cattle and sheep population, and to the USDA index of range conditions. I refer here to the range conditions report of crop and livestock estimates in the Department. These reports give no indication of a long time trend. By their nature, they could not be expected to do so.

Let's examine, briefly, these "refutations" of statements and beliefs that there has been considerable and widespread loss in western range resources.

Fifty years ago scarcely any of the beef cattle of the eleven western states could be classed as farm cattle. Now, more than half of them must be so classed. At the turn of the century, crop feeds and

protein range supplements were little used in the winter maintenance of range cattle. Now, these feeds account for three or four months of the year's feed and forage supply. Western range lands, excluding those lost to cultivation, now probably yield considerably less grazing than they did forty or fifty years ago. The increased use of crop feeds and the use of more efficient animals obscure this change in the resource, as far as livestock production effects are concerned. We must recognize, too, that for some types of range the livestock grazing use and the weights of the animals marketed may be well maintained for quite a period of years, while, at the same time, adverse changes occur in the soil-holding range plants and in the soils.

Now, let's have a look at some of the changes that have taken place out on the land in the decline of western range resources, and let's see how these changes in the resources have caused consequent changes in the economy of the stock ranches. In presenting this picture, let's use a concept of natural geographic regions of the West. These regions coincide, in a general way, with the main range forage types of the West.

Range resources of the Northern Plains, east from the Northern Rocky Mountains to the ninety-eighth meridian and south from Canada to the Platte River, are neither greatly changed nor much deteriorated, except for the "go back" lands that were once farmed. This is the only one of the main range types of the West that has not undergone widespread change through use. The reason for this is, principally, a relationship between the ecology of this range type and the economics of its use that favors moderate grazing. Heavy use of this range changes it from an association of the mid-grasses and the short grasses to a pure short grass type. The short grasses are sod formers and good soil protectors. Under heavy use the short grasses often form a dense turf that yields only a small growth volume of range forage, and that is seasonally unbalanced. The short grasses are the warm weather grasses, and the mid-grasses are the cool weather grasses that afford much of the spring and fall range growth.

Thus, we see that overuse of the Northern Plains mixed prairie range type brings a quick economic penalty, before the occurrence of any considerable range plant and soil losses. It doesn't pay to overgraze this range, and that situation is usually definite and obvious. Too bad that we do not have this favorable relationship

between good range plant ecology and good ranch production economics for the other main range types of the West, but we do not.

Range land resources of the Central Plains, from the Platte River to the southern limit of the high plains in northern Texas, do have an ecologic and use relationship nearly comparable with those of the Northern Plains. However, the production possibilities in the Central Plains for grain sorghums, dry land corn, and winter wheat pasturage, have induced widespread adaptation of stock ranching toward stock farming. As a consequence, good maintenance of the native grassland is of less economic consequence for many of the stock growers. Native pastures are overused and the short grass sod furnishes some summer grazing that fits in fairly well with crop feeds and pastures and serves as an "exercise ground" when the livestock must be out of the fields. However where the Central Plains range lands are used in ranches, the economics of their use is comparable with the Northern Plains. The favorable economics of moderate use is, however, somewhat less definite, since the cool weather mid-grasses are less important and the warm weather short grasses more important in the year's range forage production.

Southern Plains range lands have shifted rapidly during the past thirty or forty years from a grasslands appearance to a brushlands aspect, and from a predominance of cattle grazing to a predominance of sheep and goat grazing. This shift to sheep and goats has been especially pronounced in the Texas Edwards Plateau; also in the Trans Pecos parts of Texas and New Mexico. The total cattle population of Texas did not decline very much during the period of this shift, but the center of Texas cattle population has shifted eastward, out of the range country. Texas sheep numbers nearly tripled between 1920 and 1940, and this has been associated with the shift in the Southern Plains range type to brush, shrub and weed growth and a diminution of the perennial grasses.

Probably this shift in range plant association and the consequent change in ranch economy have not materially lowered the income of the ranches, for the present. But, loss of the perennial grasses as soil protectors has greatly increased the soil erosion problems of Southern Plains range lands.

Let's turn next to the Rocky Mountain Region, which lies between the plateau country to the west and the Great Plains to

the east. Range resources of this region consist mainly of the foothill grasslands, of the bunchgrass cattle feed in the ponderosa pine zone of the mountains, and of the sub-alpine and alpine sheep range of the higher mountains. Most of these resources are in a down-trend of range plant ecology and soil conditions. For most of the region, however, the consequence of this trend in the range resource does not yet show up in changed ranch economics. As the perennial bunchgrasses have diminished from overuse, the livestock production has been fairly well sustained on the browse feed and on the annual grasses and weeds that are not good soil protectors. Soil erosion can, in this situation, reach an advanced stage before the livestock production and the ranch economics are materially lowered. This is the situation that jeopardizes the watershed lands of much of the Rocky Mountain Region, the headwaters of the main streams of the West and the source of much of its water.

We look next at the range resources of the Intermountain Region, the region westward from the Rocky Mountains to the Sierras and the Cascades, and northward from the Mogollon "rim." Most important of the several range types of this region is the great sagebrush range type. It is greatly changed, and the economics of its use is changed accordingly. Once the sagebrush stands were open, with a good understory of the native perennial bunchgrasses. In its early use this range was, principally, cattle range. Much of it was good, season-long cattle range. Overuse for cattle grazing took out the bunchgrasses, the sagebrush stands thickened, and, throughout the eighty million or more acres of this range type, there is now an understory of the Mediterranean brome grass commonly known as cheat grass. This cheatgrass grows early in the spring and dries to a "fire tinder" by June. This change has made this range a spring range instead of a season-long range. It can be used for range livestock production seasonally, in the spring and early summer when the cheatgrass is green, if such spring range can be fitted in with other seasonal ranges, meadow grazing and crop feeds to complete the year's operation. The cheatgrass isn't much good after it dries. Many a cattle ranch has, because of this change in the sagebrush lands, had to reduce cattle numbers drastically and depend much more upon summer grazing of the ranch hay meadows.

In the more arid parts of this range type, such as southern Idaho and western Nevada, cheatgrass range fires are destroying the sagebrush, thus resulting in a pure cheatgrass stand. Cheatgrass

is a poor soil protector on erodible slopes, especially when burned over. Competent range conservationists say that they foresee a rapid trend to true desert conditions for much of this land.

Let's look at California range resources and ranching next. Northeastern California range lands are similar to those of the Intermountain Region, so we will confine our attention to the range lands that rim the California central valley—the Sierra foothills and the hills of the coast mountain ranges. Two important changes have occurred in the range resource of what is now known as the California annual grass range type. This range resource was once an association of native perennial grasses and native annual grasses. Now it consists entirely of annual grasses, native and exotic—the native perennial grasses now occur only in relic stands. In the upper or brush zone of this range type, range brush burning has caused accelerated soil erosion on much of the land in the brush zone.

Growth and use of the California annual grasses are highly seasonal, from November to June, or during the season of winter rains. Stocker cattle are imported in large numbers from nearby states to use this highly seasonal range grazing, and the breeding herd part of the ranch operation is maintained through the summer on the harsh, dry oat and brome grasses, with addition of a protein supplement to the range grazing. Perennial grasses, such as were once a part of this range type, would permit a larger breeding herd operation, with better summer grazing, and a decrease in the speculative purchase of stocker cattle to use the highly seasonal range forage of the annuals.

In the southwestern region, south of the Mogollon rim and between the Colorado River and the Rio Grande, we see a startling contrast between the desert shrub lands and some spectacular semi-desert grasslands in southeastern Arizona and southwestern New Mexico. These grasslands have remained in reasonably good condition.

We are told by competent ecologists, however, that the present southwestern desert shrub lands once had a grasslands aspect; that, before they were long overused they were in a period of soil formation and ecologic uptrend. Now, we see the rapid eroding out of the flat alluvial valleys and drainageways of the streams. An illustration of this is the rapid destruction of the lands of the Rio Puerco drainage, and the consequent high rate of sedimentation into Elephant Butte reservoir. Some of the "desert" lands of this region

that once supported reasonably good yearlong cattle grazing now can be grazed only with stocker cattle in the occasional winter and spring season when favorable precipitation causes the desert annual plants to grow in volume.

So much for our word picture of what is happening to western range resources and the consequent change in ranch economics.

Perhaps considerable loss in the western range resources should not be viewed as of too much consequence, nationally. All of the beef cattle on both the farms and the ranches of the eleven western states account for probably not more than fifteen to twenty percent of the total U. S. beef production tonnage. However, these states produce about a third of the feeder animals, nationally, that go into the feedlots. Probably the foreseeable loss in western beef production as a result of losses in range resources could be offset by some relatively minor changes in corn-belt agriculture.

Continued losses in western range resources will, however, be of real consequence to western economy. Consequences would be a materially lowered income from livestock, and, much more important, some far-reaching adverse effects upon western water resources. I wish to say more about that later on.

It seems probable that we are going to have the conditions for further and considerable loss in western range resources. Likely, we are going to have the profit incentive for carrying as high a number of beef animals as possible. Present prognostications regarding the increase in the human population of the U. S. during the next twenty-five years indicate that we may have need for a beef cattle population one-fourth greater than our past all-time peak. Beef is made mostly from grass. Grain feed accounts for probably not more than fifteen percent of the total U. S. beef production tonnage. Where will we find the increased range and pasture production for any such beef cattle production? Probably in part, by continued pressure on the western range resources.

One of the currently live policy questions in the use and conservation of western range resources is that of private versus public ownership, especially for the lands in Federal public ownership. One viewpoint concerning this issue is that overuse and mismanagement of the resource are more likely to occur on lands in public ownership because of insecurity of tenure and lack of management control by the grazing users. This viewpoint argues for private ownership of all lands used for grazing, perhaps excepting the lands

of multiple uses and significant public interest, on the grounds that the profit incentives of entrepreneurship will best conserve the range forage and soil resources. Corollary with this view concerning private ownership, it is said that for the lands of high public interest that must remain in public ownership, adequate security of tenure for the grazing users will give the needed economic incentives for maintenance of the resource through private entrepreneurship. We note here, as a matter of information, that the present ownership of the range resources of the eleven western states is approximately two-thirds private and one-third public. This is in terms of production rather than of acreage.

It is my belief that, until rather recently, there has not been any significant relationship between the kind of ownership and the good use of western range resources. Some of the best conservation has been on privately owned lands; some large areas long in private ownership have been badly used—the Texas Trans-Pecos District, for example. Until recently, numbers of livestock grazed on the public lands closely paralleled the trends of total western cattle and sheep numbers. Since 1940, however, the grazing of cattle on the western national forests has been reduced during the period of uptrend in western cattle numbers. This is in contrast with the period of the first World War, when nearly a million additional head of cattle were admitted to the national forests for grazing as a "war emergency measure."

It seems probable that the most important causes of misuse and loss of western range resources are the economic influences and the lack of management "know how." Most important among the economic influences I would rate the considerable lag between ecologic and economic trends, for most of the main range types; the wide production swings of an arid region and the tendency to base financial structure on the favorable periods; the problems of land tenure in good management, especially for the private lands.

Lack of management "know how" as a cause of loss in western range resources probably can't be changed very rapidly. Meanwhile, we foresee the probable economic basis for continued use pressure on the western range resources. What are the possible policy and program alternatives for better use and conservation of these resources?

In thinking about these policy and program alternatives, let's look first at the public lands. Principally, these lands are the 135

million acres of the national forest land of the eleven western states, and the some 180 million acres of the lands remaining in the public domain when the Taylor Act was passed in 1934. Since then, some 140 million acres of these lands have, under this Act, been included in Federal grazing districts.

National forests are, mainly, the western mountainous uplands. These lands are not all timbered: in fact, commercial timber resource accounts for less than half of their area. Timber, brush, shrubs and grass cover most of the western national forests. About half of their area is used for the grazing of domestic livestock.

Because of their watershed aspects, the western national forest lands are heavily fraught with public interest. These lands originate nearly three-fourths of the western water supplies available for agricultural, urban and industrial use in the arid West. Western mountainous uplands above 6,000 feet in elevation yield most of the water. Misuse of the upland watershed lands and consequent changes in vegetation and soils can greatly alter the hydrology of these lands. Surface runoff can be increased at the expense of the ground water storages, time of delivery of the runoff can be considerably changed, quality and useability of the water can be damaged by increased sedimentation.

Grazing use of these lands should be such as will not interfere with good watershed use. It might be argued that, with long-term and secure tenure for the grazing user, profit incentives in the grazing use and the maintenance of good watershed conditions would be coincident. However, for most of the national forest grazing, the usual calculations of production economics do not favor the maintenance of plant and soil conditions needed for good watershed management. Thus, we arrive at the conclusion that the grazing use of the western national forest lands must be constantly subject to review and revision by the administrative management agency, and that the grazing users must accept any changes needed for the watershed use and other uses of high public value.

The question has been raised whether the upsurge of western deer and elk populations during the past four or five decades has contributed materially to the grazing overuse of western wild lands. In localized situations this appears to be true, but it isn't very important in the general picture for the upland range resources. Deer and elk use many browse feeds not much used by the domestic livestock, and the deer eat browse in preference to grass. Much of

the upland summer range used by deer is too rough and inaccessible for range use by domestic livestock.

Somewhat in contrast with the national forests, nearly all of the lands of the public domain are used for the grazing of domestic livestock. These are lands of low grazing capacity—about six head of cattle per section or twenty-five head of sheep per section on a basis of yearlong grazing—and in the past they have been below the margin for investment in management facilities and payment of taxes by private ownership. Livestock prices and ranch earnings of recent years have lifted many of these lands, perhaps temporarily, above the margin for private ownership. As a consequence, there has been a considerable demand for policy and legislative changes to permit ready purchase of these lands by grazing users.

Some of these public lands have considerable value in wildlife and recreational uses. They are the winter and spring ranges for many of the western deer herds. These are not watershed lands in the sense of water producing lands, but some of them have become a subject of considerable public interest and concern as sources of sedimentation. As an illustration of this, it is estimated that the Rio Puerco drainage of the Rio Grande yields 60 percent of the sediment and only 10 percent of the water entering the Elephant Butte reservoir. Competent conservationists state that the arid lands of the public domain have, because of their erosion and sedimentation condition and potential, become the most important problem lands of the West, and that their grazing use must rapidly be subordinated to the necessary rehabilitation and conservation measures that are going to require heavy public expenditures in the general public interest.

For the conservation and good use of the *privately-owned* range resources of the West, we need a good program of educational and extension work in range management. In the Northern and the Central Plains, especially, such work should be closely associated with extension work in livestock ranch production economics, for in these regions it is generally true that range conservation pays dividends, within the time of ordinary foresight and usual business calculation. For most of the other regions of the West, extension work in range management must be closely integrated with the work of the conservation action programs that can use public funds for *resource* conservation in the general public interest. For here often the ranch production economics results of range land

conservation seem remote and uncertain, due to inherent factors of ecologic and economic relationships, or because the conservation problems have, in our past exploitative rural economy, outrun the capacity of individual entrepreneurship for investment and waiting.

DISCUSSION

WILLIAM N. ANDERSON

Bureau of Land Management

I must confess that Mr. Saunderson gave me quite a start when he said that our range resources have declined to the extent that some parts of them can be written off as having passed or as rapidly passing the point of feasible rehabilitation.

While the Bureau of Land Management has not yet written off any of its depleted areas as not feasible of rehabilitation, we are admittedly stumped for the present on what to do toward rehabilitation of much of our cheatgrass invasion where recurrent burning so far has defied prevention, where repeated burning means continued decline, and where reseeding by present means is not practicable. We are also stumped on what to do about widespread gully erosion in areas where direct structural treatment is financially out of the question.

These, however, appear to be problems of technique rather than cases where the range has deteriorated so far that it will not respond to treatment where treatment is feasible. For example, an area near Bliss, Idaho, was severely depleted for many years by heavy over-grazing and recurrent burning. Vegetative cover a few years ago declined to a point where wind erosion took over and dune formation began. Despite this advanced state of depletion, reseeding treatment reclothed this area and controlled the erosion in two years' time. This experience indicates that proper management and rehabilitation efforts should succeed in preventing declines to "true desert" conditions in this area as long as precipitation continues at present normals.

Observations in grazing districts indicate that the rate of decline in the range resources has been at least slowed down, and in some areas the trend has been reversed. Nevertheless, still further large readjustments in livestock use must be made in order to entirely halt the decline.

A brighter aspect is seen in many studies which have shown that net returns to livestock operators commonly increase when numbers of stock on over-used ranges are reduced to a point permitting forage recovery. Once an upward trend is established, numbers may be again gradually built up. By careful management the restored range can be made to safely carry even greater numbers than those under which it is now declining.

Despite these favorable signs, I cannot subscribe to the view indicated by Dr. Vass that upward trends in western livestock populations demonstrate a continuing healthy condition of the range as a whole. The point is not clearly demonstrable from production analyses because of the lack of

comparable statistics over a sufficient time period. Many changes have taken place which make it impossible to arrive at conclusions as to the degree the range contributes to increased production. Much former range land now is in crop production; increased livestock populations are supported by these crop lands; present western livestock populations include large numbers which do not use the range at all and others that use it but little; range cattle now are generally sold at much younger ages than formerly, etc. On the other hand, the ecological evidences of decline in such areas as the Edwards Plateau of Texas and the Central Valley foothills of California, noted by Mr. Saunderson, and the similar evidences seen in the continuing increase in sagebrush density throughout the intermountain area, are too frequent and extensive to be dismissed as isolated examples.

As Mr. Saunderson has pointed out, the importance of this decline is not reflected in grazing values alone, but in all associated values. The erosion problem on the Rio Puerco and its effect upon Elephant Butte Reservoir is but one of many examples which might be cited. Proper use of watersheds is essential, whether to protect downstream values subject to damage by flood, sedimentation of water storage or to protect the water shed itself from erosion. The additional importance attaching to proper range use for its effect upon ground water percolation is emphasized by current problems of lowered ground water tables in areas where pump irrigation supplements surface waters to a large extent. The vast areas of public and private ranges doubtless contribute significantly to these ground waters, since they often absorb more precipitation than they shed.

I cannot agree with Mr. Saunderson's suggestion that "Probably the foreseeable loss in western beef production as a result of losses in range resources could be offset by some relatively minor changes in Corn-belt agriculture," and that this decline would be important only to the Western economy. Resource economists commonly point to greatly pyramided benefits to the general economy deriving from relatively minor increments to new wealth from primary production. Is it not reasonable to assume that a loss of basic productive capacity of similar scale would be equally pyramidal in its adverse effect upon the general economy? I do not feel that we can dismiss the western range economy as unimportant to the nation. Certainly we cannot dismiss as inconsequential the combined effects of direct range production losses and associated losses in irrigated agriculture, power development and other associated values.

There can be no doubt that the natural human tendency—or perhaps I should say to this group the natural economic tendency—to overstock the investment-free, tax-free public ranges while protecting privately owned lands has accounted for much of the existing depletion on public ranges. It should be observed, however, that the reasons for this practice have been largely removed under the permit system on National Forests and on grazing district lands. Much of the formerly abused public range is now in individual or small-group allotments. The users have essentially the same incentives for careful use as on owned lands. Even on unallotted, common-use ranges the unauthorized user has been virtually eliminated, so there is

no longer occasion for the dog-eat-dog tactics which prevailed in the days of the open range.

With an assured tenure on grazing district range lands, the range user is expanding his natural interest in conservation to cover his whole set-up, including the public ranges. He realizes that his whole operation is no stronger than its weakest link. Hard-earned gains made on well-kept private lands are quickly lost on run-down public lands which supply the forage for his stock for a certain season. With well defined national conservation policies governing the use of these ranges, it would appear that the greatest danger of overstocking in the future will be on privately owned ranges, where economic circumstances might compel the owner to over-use in an attempt to keep land investments liquid.

There is no particular magic in either public ownership or private ownership—each seems to have found its place largely on the basis of the management and development needs and the productive capacity of the lands involved. The general lack of interest of present range users in buying the public lands, seems to indicate that the division between public and private ownership may become permanently stabilized at about present levels.

DISCUSSION

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Bureau of Agricultural Economics

It is apparent that the problems of the range area are many. Some will say that overgrazing is the primary problem, others point to tenure, or climate, or government land ownership as of greater importance.

Although not specifically stated one gains the impression from Mr. Saunderson's paper that there can be no great separation between ecological and economic trends. These two sciences always closely associated when applied to the management and use of the range resource are factors contributing to the wealth of conflicting viewpoints. The concomitant effects of economic and physical pressures on the ranching environment are not easily isolated.

One can recall statements by conservationists that in general the range has trended downward in productivity since 1890. If that be true then the effects have been obscured by the insidious advance of breeding, irrigation development, and management. The producer has not been convinced of overall range deterioration. The calf and lamb crops are higher than in the past and the livestock market weights by age class are superior to anything previously obtained. And so the chasm between producer and conservationist widens. Actually it is a socio-political-physical problem.

If we could devise a means of indicating proper land use in terms common to all factions, progress would be more rapid. The producers think more in terms of food and fiber production and income than in terms of overgrazing and plant indicators. To prove (to the producer) that overgrazing is present, conservationists should present significant differences in net production of meat between overgrazed and properly grazed ranges. And these differences should be ascribed solely to the forage production factor. The effects of feedstuffs, animal husbandry, and other non-forage

factors should be eliminated. At that point we could then be on common ground and separate fact from fable.

Mr. Saunderson has been pessimistic to the extent that we get a broad picture of range deterioration and poor land management. Everywhere there are examples of range lands that indicate good land use and management. It would be desirable to study these lands as examples of economic use of resources. The negative approach to good land use has not occasioned the desired objective.

Where Mr. Saunderson feels that range deterioration is widespread, Dr. Vass finds no such indications for Wyoming. Dr. Vass is inclined to take the producer viewpoint that it is uneconomic for the rancher to overgraze, therefore, in the long run, he cannot afford to do so. However, the statement that the Forest service ranges should respond in the same manner as do private lands seems erroneous. The private ranges of the west lie mostly at the base of or between mountain ranges. These ranges, of course, do not include the extensive short grass areas of the plains. For the most part the National Forest areas are highly seasonal ranges with rugged topography. In all aspects of use, management, multiple use, climate, and forage production they have no comparability with private range—unless that private range is intermingled. Particular management factors not applicable elsewhere must be applied to the use and administration of National Forest ranges.

Tenure may have a greater import on the problems of range economy than does overgrazing. Perhaps there is reason to wonder why in our system of free enterprise some public lands exist that do not differ in any important aspects from adjacent private lands. If the federal government wished to dispose of them by sale would the users buy them—would they return the tax cost over lengthy periods through climatic and economic depressions?

It is a well established principle in public land areas that some of the value of public range forage is capitalized into private investment. This is due to at least two factors; (1) the scarcity of certain types of seasonal range, and (2) the economic rent from public lands which is capitalized into private holdings. This would indicate that perhaps grazing fees are less than the full rent from such land. Furthermore because our land taxing system is less than perfect, private lands comparable as to site and use are taxed in like ratio. But private lands associated with public grazing privileges have economic advantages not available to lands lacking public grazing privileges.

Calculation of the value of an animal unit month of forage is liable to misdirection if one computes only on a forage or TDN basis. If we had a perfect competitive system for obtaining forage from public lands then the question of proper allocation of economic rent between various land ownerships would be academic. The Ricardian theory of distribution and law of rent has extensive limitations when applied to land in the public range states. It is difficult, to say the least, to calculate the residual return to land—land that may have no alternative uses—when the return to that land is dependent upon use of and return from other parcels of land. A grazing animal recognizes no tenure relationships.

THE OBJECTIVES, EFFECTS AND COSTS OF FEED GRAIN STORAGE*

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THE United States Government has been conducting a feed grain storage program for nearly sixteen years—ever since the Commodity Credit Corporation was organized in October, 1933. We should be able now to appraise this program, and make recommendations for the future, in the light of specific experience as well as general economics.

In order to appraise the program properly, we need to know first what objectives the program was set up to attain, and whether they were appropriate objectives. Then we can match performance against objectives, and benefits against costs.

Objectives of Feed Grain Storage

The original objectives of the CCC storage program were set forth in a brief statement by Henry A. Wallace, then Secretary of Agriculture, in 1936. In his view, the chief purpose of the "ever-normal granary" was to stabilize supplies against variations in production due to good and bad weather.¹ The first Annual Report of the CCC, published in 1940, took in more territory. It listed "three fundamental functions of the Corporation's loan program: Namely, to protect and increase farm prices, to stabilize farm prices, and to assure adequate supplies of farm products."

Were these valid objectives for a storage program?

A storage program can't raise long-time price levels. It is obvious that the first objective is not valid. A storage program clearly cannot "increase farm prices" over a period of years. What goes into storage must eventually come out; and when it comes out, it will depress prices about as much as it raised them when it went in (if the demand curve is a straight line on arithmetic paper). A program to reduce production, or to destroy some of the production, can raise the level of prices over a period of years, but a storage program cannot.

A storage program shouldn't stabilize prices against variations in

* Journal Paper No. J1684 of the Iowa Agricultural Experiment Station, Project 1013.

¹ The Agricultural Situation, Bureau of Agricultural Economics, U. S. Department of Agriculture, XX: 1, January 1, 1936.

demand. It is not an appropriate means for evening out the effects of variations in general demand. These variations in general demand, due to wars, depressions, booms, etc. do not last merely for a year at a time, to be followed by a new situation the next year, like variations in production. They may persist through most of a decade, like the depression of the 1930's, or they may be very brief. It is difficult to forecast when they will come and how long they will last. Nobody can tell in advance, therefore, how much to store nor how long to store it.

Furthermore, a storage program to stabilize prices against variations in general demand would have bad effects on low income and unemployed groups during a depression. It would accentuate the paradox of want in the midst of plenty. The government would be withholding food and raising food prices, against the interests of its consumers, many of whom would not be getting enough to eat.

A storage program however can stabilize prices against variations in supply. It can stabilize the farm prices of durable products against unpredictable variations in production due to weather. It can do this by putting the excess over average production into storage in big crop years, and taking it out in small crop years. That is the proper function of a storage program.

The question is whether we need a storage program of this sort for feed grains.

In order to answer this question, we need first to measure the variability of feed grain production, and then to show the effects of this variability on livestock production. This will provide a basis for measuring the effects of a feed grain storage program. Then we shall need to measure the costs of the storage program. The final step will be to compare the benefits with the costs.

Variability of Feed Grain and Livestock Production

The variability of the production of feed grains is shown separately by crops in Figure 1.²

Corn is by far the most important of the four crops shown. It makes up from 50 to 60 percent of the total feed concentrate supply. The greatest change in corn production from one year to the next took place from 1947 to 1949, when production increased 35 million tons—more than 1.2 billion bushels. The variations resulting from the drouth years of the 1930's were almost as great. "Year-to-year

² BAE Neg. 43928-X, Ag. Outlook Charts 1949, p. 31.

changes in United States corn production during the past 30 years (1919-1948) averaged 408 million bushels, or about 15 percent of the average production for the period (2,635 million bushels).³

In one way, this quotation understates the variation, from a storage point of view, since corn production occasionally changes in the same direction for two or three consecutive years. The coefficient of variation⁴ about the trend over the period as a whole was 14.1 percent. This means that in a normal distribution, a band ranging from 14.1 percent above average production to 14.1 percent below average production—a total range of 28.2 percent—would include 68 percent of the series of corn crops. Also, a range from $14.1 \times 0.67 = 9.5$ percent above and below average production—a total range of 19 percent—would include 50 percent of the series of corn crops.

The next most important crop, oats, appears to be less variable than corn. But this appearance is deceptive, resulting from the smaller average size of the oats crop. Proportionally, the coefficient of variation for oats—16.1 percent—is greater than for corn.

The full impact of the variation in feed grains production upon livestock production is cushioned to some extent by offsetting variations in the carryover from year-to-year, and by variations in imports. Figure 2⁵ shows the feed concentrate supply (production plus carryover plus imports). The picture here is distorted a bit by the fact that government storage programs were in effect part of the time, reducing the variation in market supplies to some extent. Yet the coefficient of variation over the period shown was 13.4 percent, nearly as great as the figure for corn production.

The effects of this variation in feed concentrate supplies on total livestock numbers is shown by the dashed line in the upper part of Figure 2. Other factors also affected the numbers of livestock fed, for example, the war in the latter part of the period. But Figure 2

³ "The Feed Situation," Bureau of Agricultural Economics, U. S. Department of Agriculture, December, 1948, p. 11.

⁴ The coefficient of variation—the standard deviation divided by the mean—is used here, to enable direct comparisons to be made among the different series, independent of the units in which they are expressed. The deviations are measured from trends fitted by the method of orthogonal polynomials.

A curve of higher degree was used whenever its use brought a significant reduction in the variance. Linear trends were used for feed concentrates, hogs on farms, total livestock, and pork. Second degree polynomials were used for corn and oats. A third polynomial was used for total meat.

This job was done by Joe Boyd at North Carolina State College.

⁵ BAE Neg. 46500A-X Ag. O.C. 1949, p. 34.

shows that the controlling factor was the total supplies of feed. No matter how high livestock prices go, farmers cannot produce more livestock than their feed supplies will support.

The numbers of livestock fed annually are shown separately by species in Figure 3.⁶ The coefficient of variation for total livestock numbers was 6.7 percent. Hog numbers were the most variable of any species. Their coefficient of variation was 14.2 percent.

Total meat production varied a little more than total livestock numbers, as shown in Figure 4.⁷ The coefficient of variation in this case was 8.6 percent. Pork production varied more than other meats; its coefficient of variation was 14.3 percent. Milk production was relatively stable.

In sum, then: The variation in corn and oats production (averaging roughly from 10 percent above to 10 percent below average production) does not cause much variation in beef cattle production nor in milk production; but it does cause an equal variation (from 10 percent above to 10 percent below average production) in hog and pork production.

Effects of Stabilizing Feed Grain Supplies

The objective of a feed grain storage program should be to smooth out the variations in feeds production by storage operations, and thus smooth out the variations in livestock production.

This smoothing out would have two effects. It would affect the income of feed grain and hog producers, and it would affect the cost of producing hogs.

The demand curve for corn is a straight line on arithmetic paper, with an average elasticity of about -0.65. Simple arithmetic shows that a storage program for corn, in effect converting large and small crops to average crops, would increase growers' incomes between two and three percent. (Details omitted here.)

Most of the corn crop, of course, is fed to livestock, not sold as cash grain. The demand curve for hogs, which are the principal consumers of corn, happens to have about the same elasticity and curvature as the demand for corn. A corn storage program that stabilized hog production would increase hog producers' incomes in the same way that it would increase corn producers' incomes if they sold their corn as cash grain.

⁶ BAE Neg. 46824-X, Ag. O.C. 1949, p. 35.

⁷ BAE Neg. 43312-X, Ag. O.C. 1949, p. 37.

A feed grain storage program would also affect hog production, processing, and distribution costs. Hog and pork production varies fully as much as corn production. Variations in production increase production and distribution costs. Equipment adequate to handle the peak load stands partly idle when production is low, and idle equipment increases per unit costs.

A full quantitative study of how much the variations in hog production raise costs is a farm management and distribution problem beyond the space limits of this paper. But earlier studies indicate that stabilization, especially stabilization that was assured in advance, would reduce hog production costs perhaps two or three percent. It would also reduce the costs of distribution.

Costs of a Feed Grain Storage Program

Corn is by far the most important feed grain crop. Oats is the second. It is cheaper to store corn on the cob than threshed oats. For these reasons, stabilizing corn supplies, with an allowance for oats too, would provide reasonably complete stabilization of total feed grain supplies at the lowest cost.

Complete stabilization of the market supplies of corn would hardly be practical. From 1870 to 1900, storage stocks of corn up to a billion bushels in size would have been large enough to stabilize corn supplies. During the decade from 1900-10, however, seven large corn crops occurred in succession, and the stabilization stocks would have increased to about two billion bushels. In the 1920's they would have grown larger yet, to nearly three billion bushels. Yet they still would not have been large enough to fill in the gap caused by the succession of four short crops from 1933-36 inclusive.

Droughts as severe and close together as those of 1934-36 have occurred only once in 80 years. It would be dubious wisdom to carry large stocks for 20 years or more in order to cope with droughts like these, especially since this would involve heroic extrapolation of stabilization base trends in a situation where everything else was unstable. If the years 1934-36 are excluded, stocks of a billion bushels would have been large enough to stabilize corn supplies.

An additional 100 million bushels of corn would take care of the variations in oats production. Feed wheat stabilization, a comparatively small matter, probably should be conducted in the western wheat feeding areas, close to the livestock where the need for it is greatest.

An additional quantity of corn should be stored to meet unforeseen short-time increases in demand. For military preparedness, a billion bushels would not be too much. But that is a military matter. Those stocks should be carried, if at all, on a military budget. We will stick to peacetime requirements here. For this purpose, a relatively small quantity—say two hundred million bushels—may be sufficient.

These minimum reserve stocks might also come in handy for another purpose. The stabilization stocks should not be drawn down to zero, even in a very short crop year, for the next crop may be short too. This happened in 1935 and 1936, after the very short crop of 1934. This is such a rare case, however, that it would hardly justify carrying reserve supplies for that reason alone.

The three items above add up to 1.3 billion bushels. Stocks amounting at their maximum to this figure would be large enough to do a reasonably good job of stabilizing the supplies of feed grains.

Study of Figure 1 shows that the distribution of corn crop sizes is asymmetrical. There is a tendency for several years of moderately good corn crops to come consecutively, followed by one or two severely short crops. Stabilization stocks usually would build up over a period of several years and then be drawn down at one swoop. The stocks frequently would need to be carried for as long as five years at a time. Stocks would have accumulated like this for several years, and then have been used up in one year, over several five-year periods in the past—from 1919 to 1924; from 1925 to 1930; from 1931 to 1936; and from 1942 to 1947.

In the preceding sections, we estimated that quantities of corn ranging from 200 million bushels minimum reserve up to 1,300 million maximum—averaging 750—would need to be carried, sometimes for as much as five years at a time, and frequently for two or three years at a time. The average length of time would be perhaps three years. Thus corn on the average would be carried for about three years, and dumped on the fourth. This would require carrying an average quantity of $750 \times \frac{3}{4} = 562$ million bushels of corn annually.

Before World War II, the estimated cost of storing corn on the farm was about half a cent per bushel per month, or six cents per year. The CCC paid farmers five cents a year for several years, then seven cents. Now it is offering farmers 10 cents per bushel to reseal

their 1948 corn until July 31, 1949, a period of nearly two years. It pays seven cents per bushel for storing wheat.

The CCC only offers to pay storage in certain years when it considers that conditions warrant it. Perhaps the CCC will do this about half the time. This would make the cost to the CCC equivalent to five cents per year.

Large bins like those that the CCC is putting up this year cost from 17 to 29 cents per bushel erected. They should be good for 15 years, with only modest maintenance costs. Thus the annual cost of these large bins would be less than four cents per bushel. Smaller farm-sized bins would cost more, perhaps as much as six cents per bushel.

These costs would be incurred on the entire storage capacity of 1,300 million bushels, whether the bins were full or empty. If about half of the capacity were large CCC bins and the other half were small farm bins, the average annual cost would be about five cents per bushel. That would amount to 65 million dollars. On an average crop of three billion bushels, worth a little more than a dollar a bushel, that would amount to about two percent of the value of the crop.

We saw in the preceding sections that a feed grain stabilization program would increase corn producers' incomes from two to three percent, and reduce hog production costs by a less exactly determinable amount, perhaps also two or three percent. These amounts would add up to about five percent. The storage program would cost about two percent of the value of the corn crop. The total value of hog production in the United States averages about two thirds of the total value of the corn crop. Some reductions also would be made in distribution costs. Ignoring several other qualifications and complications, we can conclude that a feed grain storage program would be worth (to producers in the short run, and to consumers in the long run) several times as much as it would cost.

A Feed Grain Storage Program Could Finance Itself

In a narrow but specific financial sense, a feed grain stabilization program need not cost anything. It could finance itself.

The loan rates for large crops could be set slightly lower than the rate for small crops. This would provide something less than complete stabilization, but complete stabilization appears impractical

anyway. The rise in price from large crop years to small crop years then would cover the costs of storage.

The loan rates for large crops could be set lower than the rate for small crops by setting up, in advance, a schedule of loan rates varying inversely with corn supplies.

A total range of 20 percent—only half the range of 40 percent that is written into the Agricultural Act of 1948—would be more than ample for this purpose.

For other crops, such as cotton, where stabilization of incomes is desirable, the range of 40 percent is not great enough. For these crops, the range should be increased at least to 60 percent.

In any case, the basic loan rate (the rate for an average-weather crop) should be announced early. March would be early enough to help farmers plan the acreage they would plant. But if the rate could be announced several months earlier yet—in November, before farmers breed their sows for the spring pig crop—that would help farmers plan their hog production as well. The final rate for the current crop (as determined by the size of the current crop plus carryover) could be announced shortly before, so as to clear up the final announcement for the current crop before the basic rate for the new crop was announced.

Setting the Basic Loan Rate Each Year

The final problem then would be how to set the basic loan rate for the new crop year.

The principle involved here is clear. The basic rate should be set at the level that would move an average-weather crop on the anticipated acreage into consumption.

The problem is how to put this principle into practice. It is not easy to forecast the strength of the demand from one to two years ahead. Millions of farmers, however, now do it every year as best they can, as individuals; the U.S.D.A. ought to be able to do it better. The more difficult problem is how to resist the political pressure on the U.S.D.A. to set the loan rate high in a futile effort to raise long-time average price levels.

The existing parity formula and the recently proposed modifications of it are not suitable bases for loan rates. Parity is based on the past rather than the future, and it is designed to stabilize prices against variations in demand as well as supply. Loan rates based even on a modernized parity are likely to be too high, reducing con-

sumption and increasing production until storage stocks grow beyond the size needed for stabilization purposes.

Loan rates based on parity could be brought into line with economic realities by writing into the law the provision that whenever the corn storage stocks at the end of the crop year (that is, the carryover October 1) exceeded the quantity needed for stabilization purposes, the basic loan rate for the next crop would be reduced proportionally.⁸

Similarly, at the lower end of the range, if the carryover were less than the minimum quantity needed for stabilization purposes, the basic loan rate for the next crop would be increased proportionally.

Thus if the carryover were 1.43 billion bushels, 10 percent in excess of the 1.3 billion maximum needed for stabilization purposes, the basic loan rate for the next crop (to be harvested a year later) would automatically be reduced 10 percent. At the other extreme, if the carryover were only 70 million bushels, 10 percent (of 1.3 billion) less than the 200 million minimum needed for stabilization purposes, the basic loan rate for the next crop would automatically be increased 10 percent.

This system would be clumsy, slow, and in certain circumstances could be a bit erratic. But it would move the loan program from where it is now toward a more rational system, and do it automatically.

The Program is Basically Physical

Let us now take a little longer look at the future.

In principle, the best way to run the feed grain storage program would be to have no loan rates or loans at all.

A feed grain storage program is essentially a physical program. The purpose of the storage operations is to smooth out the variations in feed grain production, by putting the excess over average-weather production into storage in good crop years and taking it out in poor crop years.

This program need not involve loan or price problems at all. Instead of the loan rates determining how much is put in or taken out of storage, as at present, the program could be handled purely

⁸ A proportional reduction is suggested here only for simplicity and brevity. Perhaps the reduction should be only one-half as great as proportional for the first 10 percent excess of quantity, to throw the loan rate reduction process into gear less suddenly.

as a physical matter; the quantity put in or taken out of storage then would determine the price.

The simplest way to run this sort of a program would be for the U.S.D.A. to remove and later return the proper quantities of feed grains to the market by buying and selling rather than by loans. This would give the U.S.D.A. the most direct and positive control over the storage stocks.

Some practical difficulties would lie in the way of putting these principles into effect.

The first difficulty is a minor one. It is cheaper and more efficient for the U.S.D.A. to make loans on corn in the crib on the farm where it was grown than to buy it and take care of it itself. A buying and selling program would cost more, and get the U.S.D.A. more into the grain business, than the present (primarily) loan program.

The second difficulty is a major one. In the past, the feed grain storage program has been so much an integral part of the whole agricultural price support program that separating the two appeared to be a more drastic operation than the patient would accept or perhaps survive.

A fundamental change may be taking place, however, which would reduce or remove this major difficulty. Secretary Brannan's proposal to let the prices of perishable products seek their own levels and make up the difference between those prices and the "support" levels by direct payments to farmers has been rejected by Congress this year, but the idea may be accepted at some later time. It could be extended to durable products as well as perishable products. No one would worry then about the level of loan rates or open-market prices. The U.S.D.A. then could simply buy and sell feed grains on a physical basis, so as to keep market supplies stable from year to year, untrammeled by any complications about loan rates. Or, if the advantages of loans rather than purchases and sales were considerable, it could use loans as at present, unhampered by upward pressure or unsuitable formulas for loan rates. The upward pressure and the formulas would be applied instead to the "support" prices, not to the loan rates as at present, leaving the storage program free, as it should be, to deal exclusively with the problem of variable feed supplies.

DISCUSSION

ROLAND WELBORN

Swift and Company

Dr. Shepherd has a long and enviable experience in the study of corn prices and their relationship to livestock production and to the agricultural economy generally. He has for years given detailed study to the broad economics of corn storage. It would therefore be somewhat presumptuous on my part to do anything more than to raise certain questions regarding both the philosophy back of his conclusions and the basic evidence from which those conclusions are drawn.

1. So far as I can judge, Dr. Shepherd's calculation of the coefficient of variation of corn production is based on simple historical deviation of production from the long-time trend, including the variations attributable to both the extreme drought of the mid-thirties and the stimulus of two world wars, both of which he rules out as extremities which a storage program should not attempt to anticipate. I would be interested to know how much change would be involved in his concept of normal variation if he measured variation in terms of animal units fed, as he does (which is a more logical measure of availability of feed grains) allowing for trends, but *leaving out of the computations the extremes attributable to droughts and wars.*

2. I must leave to those who are more proficient statisticians than I the task of evaluating the accuracy of Dr. Shepherd's regression of supply on price. I find myself doubting greatly the significance of the calculated two to three percent variation in income from normal vs. variable crops, particularly in view of the fact that the basic data from which those estimates are derived is scarcely accurate within those limits. While such estimates are useful as a basis for price anticipations I would raise the question as to whether they are sufficiently dependable to provide a basis for investing 1.5 billion dollars in an untried economic venture.

3. Dr. Shepherd uses CCC's storage rate as the total cost involved in a corn storage program. These additional refinements may make a significant difference in his cost estimates: (a) there is an interest charge on the investment in corn of at least two or three percent per annum which should appropriately be charged against the program; (b) the same argument that is used to show reduction in the cost of producing pork is applicable in reverse to the cost of storing corn. That is to say, the cost of storage must be calculated as the cost of the facilities necessary to store the largest anticipated volume. If facilities for 1.3 billion bushels of corn storage must be constructed, the cost of those facilities becomes the perpetual cost of a storage program regardless of year to year variation in storage volume; (c) there is a relatively negligible item of administrative cost—minor in this instance, but a persistent part of a broader pattern of costs that in the aggregate has come to absorb a substantial portion of the total national income.

4. The estimated savings as a result of stabilization of pork production presupposes that grain supply stabilization would indeed stabilize pork

output. While the influence of corn supply is a major element in determining hog numbers, it is still appropriate to question how much of the variation still remains after full allowance for feed grain supply variation has been made. It is also an interesting question as to how much variation actually occurs in hog production on farms where any considerable amount of the overhead is specifically assignable to the hog enterprise.

5. I will pass over lightly the question as to whether the level of corn price is likely to be raised or lowered beyond what it would otherwise be by the existence of large stockpiles of corn. In theory, of course, the case is clear. But practice is something else again, and I am personally somewhat fearful that the existence of an average inventory in excess of needs of over 500 million bushel would result in an average corn price to farmers 15 to 20 cents per bushel lower than would otherwise prevail. That consideration is of no significance, of course, if the price is always at the loan rate, but I, for one, hope that there is something better for the future than a perpetual reliance by corn producers upon the United States Department of Agriculture price support program.

6. If Dr. Shepherd's notions of the profitability of such a program is correct, it is interesting to raise the question as to why the private economy has not undertaken it. While I have no proof to offer on the subject, I would like to suggest the following answer: excluding war periods and the mid-thirties drought, there have been only 23 years out of the 69 years since 1880 in which corn price actually increased from year to year by more than 10 percent. I submit to you that as an ordinary business proposition you wouldn't invest much money, even if you were a hog producer, in a scheme that has such a dismal profit record behind it.

All of the foregoing has been debate over quantitative judgments, a debate which can never be totally resolved, although the evidence can be clarified by a continuation of careful technical work. The major questions are those which remain, if I may paraphrase Frank Knight, after the economist has made his contribution, thereby clearing the way for a discussion of the broader issues.

The science of economics (and those who profess it) has a long tradition of argument to the effect that the material well-being of human kind is enhanced by the free play of economic competition. The only basis for the violation of these principles in the public interest is where clear evidence exists of institutional imperfections which prevent the maximization of total income through the exercise of individual initiative. Until more convincing evidence has been presented than I have thus far seen of the failure of private industry to adequately handle the distribution of corn supplies through time, and subject to a more convincing accounting of the gains to the whole economy to be made from monopolistic manipulation of corn supplies and prices, I doubt seriously that the type of institution proposed by Dr. Shepherd would make any material contribution to economic efficiency or to human welfare over the long run.

THE MISSOURI RIVER DEVELOPMENT PROGRAM

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THE purpose of this paper is to outline the major features of the Missouri River Basin development program and to estimate some of the economic magnitudes involved. Other papers to follow will appraise some of the problems.

Next to the Mississippi River drainage system, of which it is a part, the Missouri Basin is the largest basin in the United States. It includes more than a sixth of the land area, about a fourth of the farm land, and a fourth of the cropland of the country. The basin contains about 10 percent of our farm population. Half of its farm population is concentrated in the lower fourth and the remainder is sparsely populated.

The Pick-Sloan Plan

The programs for development of the Missouri Basin represent an evolution of plans by various agencies based on years of experience and investigation. For example, the Corps of Engineers formulated a basin-wide plan in 1943 which expanded the previous flood-control and navigation plans to include additional multiple-purpose reservoirs on the main stem and tributaries of the Missouri River, and flood protection works for municipalities and agricultural lands. In the following year, the Bureau of Reclamation recommended a plan for basin-wide development for irrigation, power and other purposes. These reports were integrated by the two agencies and presented to Congress. In the Flood Control Act of December 22, 1944, Congress approved the coordinated plan, commonly known as the Pick-Sloan plan. Since that time additional proposals have been made. Present plans include about 150 reservoirs with a storage capacity of about 100 million acre feet; levees for protection of two million acres of agricultural lands in the Missouri Valley and major tributaries below Sioux City, Iowa; levees for municipal areas; systems for distribution of irrigation water for new lands totaling five million acres, and supplemental water for another two million acres; hydroelectric plants having an eventual installed capacity of 1,600,000 kilowatts of power and an annual output estimated at 10 billion kilowatt hours of electrical energy;

and improvement of the channel and provisions for navigation from Sioux City to the mouth of the river.¹ Congress has authorized a total amount of \$350,000,000 to be expended by the Corps of Engineers and \$350,000,000 to be expended by the Bureau of Reclamation for partial accomplishment of the program.²

According to the Pick-Sloan plan, the multiple-purpose reservoir projects on the Missouri River will provide for the maximum practicable storage of water on the main stem. The water to be impounded in these, as well as in the other multiple-purpose reservoirs on tributaries, will be utilized for irrigation, navigation, power and other multiple purposes. Sufficient storage will be reserved in each reservoir to provide for flood control needs. To protect towns or municipalities and agricultural areas that are subject to flooding from run-off originating in storms over areas not controlled by the reservoir projects, the plan provides for a system of levees on both banks of the Missouri River from Sioux City, Iowa, to the mouth and the required flood-control works on tributaries. Water will be available for domestic and industrial water supply and pollution abatement, and it is proposed to develop the recreational uses of reservoir areas.³

Shortly after approval of the Pick-Sloan plan for the Missouri River Basin by the Congress, the Missouri Basin Inter-Agency Committee was established to provide a means for the participating federal agencies to coordinate their activities among themselves and with those of the Missouri Basin states. On this committee are five Governors of the Missouri Basin states who were selected by the Governors of the 10 states in the Basin to represent state interest in the Program. On the committee, federal interest is represented by one member each from the Corps of Engineers, War Department, the Federal Power Commission, the Department of Interior, the Department of Agriculture, and the Department of Commerce.

¹ *The Development and Control of the Missouri River*, Department of the Army, Corps of Engineers, Missouri River Division, Omaha, Nebraska, December, 1947. See also Senate Document 191, 78th Congress, 2nd Session, *Missouri River Basin* (Report by Secretary of the Interior, Harold L. Ickes, on Bureau of Reclamation's Plan for Basin Development), April, 1944. House Document 475, 78th Congress, 2nd Session, *Missouri River Basin*, March, 1944. Senate Document 247, 78th Congress, 2nd Session, *Missouri River Basin*, (Supplemental to Senate Document 191 and House Document No. 475, 78th Congress), November, 1944.

² Flood Control Acts of December 22, 1944 and July 24, 1946.

³ Message by the President to the Congress of the United States on the *Comprehensive Plan for the Development of the Mississippi River Drainage System*, July 16, 1947. Appendix 1: Comprehensive Plan for the Missouri River Basin.

The Agricultural Program

Many of the people connected with the Inter-Agency Committee and interested in development of the Missouri River have recognized that the Pick-Sloan program does not provide a complete authorization for resource development because it provides for control and use of water in the main stream channels only. They have urged that an agricultural program be developed to deal with watershed, conservation, and other land-management problems of the basin. At first it was thought that this need could be met under existing national programs. However, it was soon discovered that the agricultural phases of the development were lagging and that it was very difficult to integrate national agricultural programs with other phases of the development which were on a project basis.⁴ In July, 1948, after three years of participation in the Missouri Basin Inter-Agency Committee, the Secretary of Agriculture ordered an agricultural plan to be prepared which would integrate the activities of the Department relating to the development, utilization, and conservation of natural resources into a unified basin-wide program.⁵ The program would be designed to: "Conserve and improve the lands of the basin; build up and protect the forest resource; protect and develop the water resource; enlarge and improve the farm plant by irrigation and drainage; reduce flood and sediment damages, enhance recreation and wildlife; and otherwise support, complement and balance the programs of other agencies—particularly the engineering activities being carried out under the Pick-Sloan plan."

The agricultural program was prepared by a field committee made up of representatives of various bureaus. This group had the active cooperation of representatives of the Land-Grant Colleges and several other state and federal agencies. An inventory of land and water conservation and development needs in the basin was prepared based on past experience and investigation.⁶

The program that has been developed to meet these needs offers no startling innovation in land use or in its approach to the con-

⁴ Opinion in the Department of Agriculture has been divided. One group has favored preparing special basin programs. Another group has felt that such a move would jeopardize existing national programs.

⁵ Secretary of Agriculture Memorandum, No. 1220, July 9, 1948, *Preparation of an Agricultural Plan for the Missouri Basin*.

⁶ *Missouri River Basin Agricultural Program*. U. S. Department of Agriculture, April 1949.

servation problem. The body of the program represents functions and activities which already are under way in some measure in the basin. The unique qualities of the program are: (1) a procedure by which all phases of a complete program of land-management and upstream engineering can be applied to problem areas for conservation and flood control; (2) a procedure for integrating the work of the Department of Agriculture with that of other federal agencies on irrigation, drainage, and other land- and water-development projects, and (3) the recommendation of a greatly accelerated program for the basin which would keep pace with the engineering phases of the Pick-Sloan plan.

The agricultural program has five major operating phases.

1. A program of conservation and improvement measures on grassland and cropland is designed to reach all of the 582,000 farmers and ranchers in the basin. The goal is the application of good land-management and conservation practices to the farm and ranch lands of the basin. This would involve adoption of improved management and land use practices on the 113 million acres of cropland in the basin and the seeding of 20 million acres to grass and legumes for rotation hay and pasture. Needed also would be measures such as 1,900,000 miles of terraces, grassed waterways and others to retain or dispose of water. The privately owned grassland also needs improved management. This includes reseeding of 17,500,000 acres of depleted range, development of water supplies, fire guards, and fences.
2. A program for forest and forest range would cover an estimated 45 million acres, of which 22 million is in public ownership. The forests are a resource with many uses—timber, grazing, recreation and wildlife, and the protection of water supplies. This latter function is of particular importance in federal forests which are the source of a substantial share of the water available for irrigation. The program is designed to improve forests and ranges by applying better management, fire protection, plantings, and many other improvements. On privately owned land the program would be carried out by furnishing technical assistance and financial aid to private owners.
3. A program of stabilizing measures for small watercourses has been proposed to assure safe disposal of water in small watersheds and the lesser tributary streams. This will reinforce land conservation measures, contribute to flood control and to the protection of lands being destroyed by major gullies, bank-cutting, and sedimentation. The program contemplates the construction of measures which generally affect more than one farm. These would include gully-control structures, floodways, bank-protection works, small retarding basins and others.
4. The program for irrigation involves (a) educational, technical, credit, and financial assistance to rehabilitate and improve the use of land

and water on existing irrigation projects, (b) factual data and technical advice in areas for which new irrigation is planned, and (c) assistance and services to farmers in developing land improvements and systems of farming under new irrigation.

5. The drainage program for the Missouri Basin is planned for an estimated 5,800,000 acres now in drainage districts or needing additional drainage. It is estimated that half of this acreage needs some degree of improvement or rehabilitation. The Department will assist farmers in rehabilitating drainage systems and in constructing new systems. It will also help individual farmers with their drainage problems.

These operating phases of the agricultural program are supported by research and investigations, soil surveys and land classification, education and credit.

1. A much accelerated program of soil surveys and land classification is needed to guide the land and water program. The soils of the basin show enormous diversity. Seven types of surveys are recommended to meet the requirements of various parts of the basin. These range from intensive surveys for proposed irrigation projects to extensive surveys in forest and grazing areas.
2. Research and investigations needed to support the recommended programs of land and water development have been designed through the combined efforts of the Department of Agriculture and the Land-Grant Colleges of the Missouri Basin. Accelerated research is recommended to precede and guide the greatly expanded programs of irrigation, drainage, land treatment, and watershed management in prospect.
3. Agricultural extension activities would be intensified to assist rural people to make maximum use of land newly developed for irrigation and protected from floods by levees and drains; to make the best use of electric power; to apply accelerated land conservation and flood-reduction measures and to adjust farming to new crops, new markets, and new methods.
4. Special credit facilities are recommended to supplement private credit agencies in view of the expectation that farmers, ranchers, and landowners will invest three to four dollars for every dollar of Federal funds expended for conservation. Application of conservation measures, and development and improvement of irrigation and drainage systems often require a type of developmental credit that is unavailable from private lenders.
5. Special studies are recommended to assure that the rural electrification systems for the basin will be completed and integrated with the power features of the Pick-Sloan plan. Continuation of present authorizations will provide ample loan funds to complete electrification of the area.

The agricultural program was submitted to the Missouri Basin

Inter-Agency Committee at Rapid City, South Dakota. The Committee meeting at Helena, Montana, July 21, 1949, passed a motion that the "Inter-Agency Committee thank the Department of Agriculture for preparing the report, endorse the general objectives and recommend that Congress take the necessary steps to put the program into effect."⁷ As soon as review by other federal agencies has been completed, the report will go to Congress.

Cost of Missouri Basin Development

The cost to the Federal and State Governments of the Missouri Basin Development has been currently estimated as follows:

Corps of Engineers ⁸	\$2,019,000,000
Department of Interior ⁸	3,024,000,000
Department of Agriculture ⁹	3,092,000,000
Other Federal (6 years) ⁸	20,000,000
State Government (6 years) ⁸	100,000,000
	<hr/>
	\$8,255,000,000

The development period is usually thought of as extending over a long period of years. If 30 years is used as in the agricultural program, the annual rate of expenditures would be about \$275,000,000 for federal funds. In the fiscal year 1949 the Corps of Engineers received \$92 million for the basin, and the Department of the Interior, \$87 million, or a total of \$179 million. The Department of Agriculture made expenditures for the type of work covered in its program from its regular or national funds of about \$24 million in the Missouri Basin, but received no special appropriation in 1949 for this area. From these rough calculations it can be seen that a considerable acceleration of the agricultural program is needed to put it on a schedule that will be comparable to the other phases.

Land Use Changes

It is not the purpose here to attempt a benefit-cost analysis. However, part of my assignment was to estimate the agricultural changes from the Basin development. These might be summarized as follows:

⁷ Minutes of the Thirty-Second Meeting of the Missouri Basin Inter-Agency Committee, July 21, 1949.

⁸ Missouri Basin Inter-Agency Committee, *6-Year Program for Missouri River Basin*, July 29, 1948.

⁹ U. S. Department of Agriculture, *Missouri River Basin Agricultural Program*, April, 1949.

- Two million acres would be given protection from floods.
Five million acres now dry-farmed would be brought under irrigation.
Two million acres now irrigated would be furnished supplemental water.
One million acres of small irrigation would be developed.
Three million acres would be benefited by new or improved drainage facilities.
Ten million acres of cropland would be returned to grass.
Another ten million acres would be shifted from soil-depleting crops to rotation hay and pasture.
A land management and conservation program would be applied to all lands.
Two and one-half million acres are included in reservoir sites.
Of this, one million would be flooded only occasionally and could be continued in agricultural use.

Data on expected production changes are rather meager. Such estimates as are available indicate, for example, about a 10-percent increase in value of crop production from irrigation in the Missouri Basin and about a 19-percent increase in crop production from the conservation program. A small loss from reservoirs would amount to less than one percent.¹⁰ The net increase in production from these sources would be about 28 percent when compared to crop production in the basin and four percent when compared to national production. Other changes in production would occur because of flood protection and drainage, range management, timber production, etc. These changes would take place gradually over a long period of years.

¹⁰ Bureau of Agricultural Economics unpublished estimates based on data from the Bureau of Reclamation, Corps of Engineers, and the Soil Conservation Service. Comparisons are based on 1939-44 prices.

AN ECONOMIST'S APPRAISAL OF THE MISSOURI RIVER DEVELOPMENT PROGRAM

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THE magnitude of the Missouri River Valley in physical area and the variety and complexity of its resource use problems are such as to cause proposed resource development programs for the area to have general appeal and interest throughout the nation. In appraising the proposed developments which have been presented in the preceding paper it would be wise for us to keep two things in mind: (1) the great importance of agriculture in the Basin; (2) the strategic role of water.

The Missouri River Basin is primarily agricultural and promises to remain so for a great many years. Therefore, any sound or complete development program must, of necessity, include a sound agricultural development program including land management and soil conservation, and give primary emphasis to all aspects of the overall program which will improve and help stabilize the farm and ranch operations of the Basin.

In the upper Missouri Basin states, normal rainfall is relatively low and extremely variable with recurring droughts. In this semiarid part of the Basin, the conservation of water through sound watershed management, storage and wise use, is of primary importance; while in the lower part of the Basin a humid climate exists and flood damage is considerable. Because of these conditions maximum economic development and use of water in the Basin is a key to maximum human welfare in the area. Control and use of water in the main stream channels through big construction projects is only a part of an adequate water use program. Sound land management and cropping practices to control run-off, sound forest and range management practices to achieve maximum water-holding capacities, and stabilization of water courses to reinforce land use practices in order to hold water on the land and ease it to the main stream channels without flood or overflow damage, are all highly significant parts of a complete water use program along with large dams or construction projects.

Agricultural Development Program

Unwise management of land and poor land and cropping prac-

tices are common throughout the Missouri Basin. This in itself does not justify an extensive agricultural program of the nature proposed, however, because similar conditions exist in other river basins of the country. What justification is there for a special agricultural development program for the Missouri Basin? Is this a mere starting point for similar programs to be proposed and urged for other river basins in the nation? Or is the need in the Missouri Basin for such a program particularly acute and timely?

The Flood Control Act of 1944 places irrigation in the front rank of priority uses of water in the West. The Pick-Sloan Plan, developed by the Corps of Engineers and the U. S. Bureau of Reclamation, proposing construction of some 150 large reservoirs and for which Congress has already authorized a total of 700 million dollars, makes a complete agricultural program essential. The scope of the Pick-Sloan Plan is such that unless other programs are designed and carried out for the area which will make available the information necessary for sound overall development, a great waste of public funds as well as incomplete and unsound development may result. Moreover, the uncertain growing conditions in the upper Missouri states because of the semi-arid climate make it imperative that this large agricultural area of the nation be developed in such a way as to stabilize its production and contributions to the national welfare as quickly and as completely as possible. Large public expenditures for relief and feed and seed loans in the Upper Basin states were necessary in past years when adverse weather and business conditions and severe insect pest ravages occurred. Development programs that will help stabilize farming and ranching operations in these states will relieve the government of future relief and emergency expenditures. More important, sound agricultural development programs will permit the Missouri Valley with its great grain and meat production capacities to make its maximum contribution to the national welfare. We should not forget that one-fourth of the nation's farmland lies in the Missouri Basin. Farm output in the Basin during the past decade under favorable weather conditions has been a very significant factor in making it possible for us to improve our level of living at home at the same time that we carried out a major war and its attendant post-war reconstruction and rehabilitation programs.

The question immediately arises as to whether an agricultural

development program such as that which has been explained in the preceding paper should precede a major engineering or construction program such as the Pick-Sloan Plan, or whether it should be carried out concurrently with such a program, or whether it should follow the construction program. The facts are, of course, that the large engineering and dam construction program is already under way while the detailed agricultural development program is merely in the proposal stage. Some contend that construction planned in the Pick-Sloan program will not only needlessly flood hundreds of thousands of acres of land but will create huge silt traps, without at the same time checking serious flood water damage in the small water courses and farming areas generally. To carry out the agricultural program concurrently with the dam construction program may result in our discovering that the basically sound agricultural program will leave us with many large reservoirs which will never operate as now planned. Hence some suggest that the research and educational phases of the agricultural development program together with the land management phases should be pushed rapidly now, before any further work is done in the construction of large dams as contemplated by the Pick-Sloan Plan. The Department's agricultural program as presented indicates that what might normally be undertaken over a one hundred-year period has been telescoped into a thirty-year project proposal, but perhaps it should be telescoped still further into a fifteen- or twenty-year proposition, particularly since much of the information and resulting developments are essential for a future sound system of major dams in the Valley.

This should not be interpreted to mean that agricultural development as proposed in the five-point program should be complete in 15 to 20 years. As a matter of fact, full agricultural development will probably never be complete. The educational and research phases of the program, however, need to be greatly speeded up. The next five to 10 years should reflect tremendous expansion along these lines.

Is the Missouri Development Program Needed?

Currently we are faced with the threat of great surpluses in several farm products including wheat, one of the major products of the Missouri Basin. Acreage limitations are being worked out to reduce wheat acreage. Under these conditions, what economic

justification is there for undertaking the five-point agricultural development program proposed? It is said that the development program will ultimately result in increasing the irrigated farm land of the Basin two and a half times from the present five million acres to some 12,500,000 acres. This more than doubling of present irrigated acreage would mean a great increase in the agricultural production of the Missouri Basin, but it is estimated it would increase the total farm production of the United States by only a small amount. For example, the increased irrigated acreage contemplated under the Pick-Sloan Plan would result in a 70 percent increase in the crop output in the Upper Missouri Basin states, and a 40 percent increase in crop output for the entire Basin, but would result in an increase of only about five percent in the total United States crop output.

Part one of the five-point agricultural development program, "Conservation and Improvement Measures on Grasslands and Croplands," is designed to achieve good land management and conservation practices on all the 582,000 farms and ranches of the Basin. More than a third of the approximate three billion dollars proposed for the agricultural development program (\$1,189,630,000) is proposed to be spent on Part One. Certainly this part of the program should result in increasing the farm output of the Basin as well as to make the output more certain, consistent or stable year in and year out. The prospective increase in the country's population for the next thirty years does not seem sufficient in and of itself to warrant any large increase in farm production. Present prospects for large exports of farm products at profitable prices also do not appear bright. But, if the management and conservation practices result in increased livestock and meat production through better forage, hay and feed production, rather than increased cash grain farming, the Basin agricultural development program should fit in well with national needs for the next few decades.

The major objective of increased irrigated acreage in the Missouri Basin through large dam construction should be the stabilization of existing agricultural operations, primarily the range livestock industry through the production of more hay and feed supplies. It is generally agreed that increased numbers of livestock will be needed in the United States to maintain a satisfactory standard of living, particularly in view of prospective population increase during the next thirty years. The stabilization of the

livestock industry in the Missouri Basin can best be brought about by integration of irrigated lands with the surrounding dry bench lands and grazing areas. Development of additional irrigated farms for the production of cash crops will not contribute to the welfare of the Basin population or to the national welfare as much as will a program in which the newly irrigated lands are primarily used to stabilize operation of existing dry farm and ranch units. If ways can be worked out whereby the new irrigated acreages can be made a part of existing units and used primarily for the production of hay and feed supplies, maximum beneficial production and the most satisfactory and stabilized agriculture for the Basin can be achieved. For example, if a limited acreage, say 40 or 80 acres, of irrigated land could be made available for the individual operator where he could have his home and his operating headquarters, he could, in addition to having a satisfactory garden, produce adequate hay and feed supplies for his livestock. He might also have allotments in grazing districts for summer range of his beef cattle and produce grain on near by benchlands. If, on the other hand, newly developed irrigated areas are developed to be complete operating units alone, and are used primarily for the production of cash crops, such as wheat, beans, etc., the lands will not contribute to the further stabilization of output of existing farm and ranch units. There is no assurance in programs already under way or being proposed that such integrated use of irrigated lands will be achieved. Much good thinking and administrative action is needed along these lines now.

When one ponders the scope of some of the proposed developments, he is likely to conclude that it is some bureaucrat's idle day-dreaming. For instance, 500,000 new ponds seems like an excessive number, but the Missouri Basin covers a large area and anyone who has traversed the Plains knows it is "big" in every sense of the word. The proposed 14,000 to 16,000 small upstream dams and 400 to 600 desilting and debris basins may sound excessive, but careful study of the many small streams and water courses of the Basin will show that the number may be an underestimate, rather than the reverse. The one billion dollars proposed for this phase of development is absolutely essential if we are to get value received from the five billion dollars proposed to be spent by the Corps of Engineers and the Bureau of Reclamation in constructing 150 large dams or reservoirs.

Experience with heavy silting of large reservoirs already con-

structed in the West should emphasize that Point 3 of the five-point agricultural development program, "Stabilization of Small Watercourses," is not competitive with the Pick-Sloan large reservoir construction program, but complementary and absolutely essential for its successful operation. Point 1, "Conservation and Improvement Measures on Grasslands and Croplands," including terracing, grassing of waterways, reseeding depleted ranges, strip cropping, and contour farming is likewise basic and complementary. It would appear that the tentative allocation of two-thirds of the total of three billion dollars proposed to be spent on the agricultural development program for these two phases is justified.

Conclusions

Although the agricultural development phase of the Missouri Development Program does not have the dramatic or glamour appeal to the public imagination of the big reservoir construction phase, it nevertheless, over the long pull, promises equal if not greater advantages to the Basin and to the Nation. The estimated total cost of somewhat over eight billion dollars for the entire program is a large sum, but in terms of modern federal fiscal accounts does not loom as excessive. Before we can be certain that this eight billion dollars will be a good investment much sound thinking must be done on other phases of overall development in the Basin comparable with that which has been done by the Department of Agriculture staff members, in developing the proposed Missouri River Basin agricultural program. Reference is made to power development and utilization, including rural electrification and industrialization, and to navigation. These two enterprises are emphasized in the large dams construction phase of Missouri Basin development along with irrigation and flood control, but much heat and little light has resulted from the discussions of these two enterprises to date. There are many phases of public power development which need to be studied and an adequate program mapped out, but the navigation aspects particularly should be subject to very careful scrutiny from the standpoint of possible economic benefits before any further steps are taken to allocate water for this use in achieving a "9-foot channel," etc. Water is a very precious thing in the Upper Missouri Basin, and while the agricultural development program, if adequately carried out, would go a long way to conserve and make possible maximum avail-

ability of water in the Upper Basin, it will be of little local or national avail if the resulting water is not put to its most important and best uses. Whether navigation can qualify as a claimant in this category has certainly not been established on any sound basis. It would seem that in the long run, Basin, national and world interests would dictate that wise conservation and utilization of water for stable and maximum production of food and fiber would be a "better" use of such waters, if not the "best."

This writer concludes that the proposed eight-billion-dollar expenditure in the Missouri Basin can be a very good investment for the nation in the years ahead. Because they lack the glamour and appeal to the public imagination which some other phases of the program possess, there is grave danger that the agricultural phase and similar detailed information and proposals needed on other phases of the overall program will be sidetracked or carried out inadequately. They are basic, however, to a sound over-all development program and should take a position of priority rather than a second- or third-rank position.

For the next few years it would seem highly desirable to emphasize the five-point agricultural program and to speed up work particularly on the educational and research aspects, especially soil surveys and land management, before we proceed too far with construction of large dams and reservoirs. The agricultural development program is essentially a grassroots program. To be fully effective it will require adequate support for its educational and research phases. If such support is forthcoming and the Land-Grant Colleges and Universities' staffs are equal to the challenge, a long step will have been taken toward assurance of sound overall development of the Missouri Basin for the years to come. Complete development will take many, many years, but it's high time that we put first things first in the Missouri Basin. The proposed agricultural development program presents an important challenge to Land-Grant institutions, particularly to agricultural departments, and more especially to departments of agricultural economics and rural sociology.

A CONSERVATIONIST'S APPRAISAL OF THE MISSOURI DEVELOPMENT PROGRAM

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THE Missouri Basin includes about one-sixth of the land area, one-fourth the farm land and one-fourth the cropland of our United States. The Basin is, of course, paramount to the people who inhabit it and the agricultural significance, together with the industrial and other parts of our economy within its boundaries, makes the Basin of no little importance to the nation.

During the last three or four decades we have stepped up the development tempo within the Basin—at least the part involving direct exertion of the public's efforts. A number of lines of public endeavors were initiated during the 'teens and 'twenties. Some of these were federal activities involving application of a nation-wide program either throughout or within a specific portion of the Basin. Some were endeavors by states or through local government—as counties, municipalities, irrigation districts, drainage districts and the like. In the thirties, partly because of the depression and the drought—which was particularly severe in a large portion of the Basin—certain going public activities were re-emphasized and additional ones were initiated. Several of these stressed either new or increased emphasis upon conservation, use and development of agricultural land and water resources.

From the conservation viewpoint among the most significant of these new endeavors and results perhaps were:

1. Programs for the public providing technical services and grants of direct aid for conservation purposes;
2. Beginning of soil conservation districts as local governmental subdivisions through which landowners and operators, when they so choose, can cooperatively exercise their own initiative and responsibility for soil and water conservation purposes and obtain help from all public and private sources in so doing;
3. Increased attention to irrigation in parts of the Basin and to proper drainage in others;
4. The growing knowledge on the part of landowners and operators and the public generally that the nation's land and water resources are not limitless but that these resources could be

used to maximize productive capacity on both a current and a sustained basis and, if need be, on a reserve basis.

In 1944, we added the Pick-Sloan Plan for the Basin. This plan deals primarily with major structures along the mainstem and the large tributaries, such as large dams storing water for power production, for irrigation, and for flood control and navigation; levees and revetments for flood control; and major canals and ditches for distributing irrigation water or for draining off excess water. This plan¹ apparently serves the same general functional purposes as the declaration of policy in the most frequent type of legislative authorizing act.

And in 1949, we have the Missouri River Agricultural Program.² Since Congress has taken no action, it is still in the embryonic stage insofar as legislative action is concerned. This plan deals with two categories of activities: first the practices, measures and land uses which when adopted on the land and small tributaries conserve the land and water, and retard and reduce runoff thereby reducing floodwater and sediment damages; and secondly, activities that facilitate programs leading towards adoption of such practices, measures and land uses. The "on-site" and "off-site" effects of such of these practices, measures and land uses, as are soundly applied in the locations where they are adapted, bear both directly and indirectly on the works described in the Pick-Sloan Plan. Thus, the work described in each of the two plans is intended to be supplementary and complementary to the work described in the other. When once the work gets into gear there would be no twilight zone between the necessary large engineering works along the mainstems and the necessary work on the watershed lands and small tributaries.

In view of the setting, a conservationist's appraisal of the Missouri River Development program probably should include considerations of the need and major approaches and problems.

Cursory examination by the close observer points quickly to the need for further conservation in the Missouri Basin. Examination of available research results and survey reports shows even more vividly the necessity for this work. There can be little question but

¹ Public Law 534—78th Congress.

² The Missouri River Basin Agricultural Program, a program recommended by the Secretary of Agriculture Charles F. Brannan for the development and conservation of land, water, and forest resources, and for flood control in the Missouri River Basin, USDA, April, 1949.

that further conservation and development will be accomplished within the Basin. Also, there can be little doubt but that further conservation and development is practicable from the separate or combined viewpoint of individuals, local governmental subdivisions, the states, and the nation. The many questions as to what, how, and when will only be answered month by month, year by year, and decade by decade as progress is made—but then not to the satisfaction of all. The estimates on quantity of work needed as shown in either the Pick-Sloan or in the Agricultural Plan developed by the Department of Agriculture will undoubtedly be subsequently proven less than completely correct. But the main consideration is that the types of work described need to be done. Surely methods and approaches will be improved from job to job as the work progresses, experience is gained and additional research conclusions become available.

Each type of work described in the five operational programs and in the five facilitating programs of the agricultural plan are now being carried on—to varying degrees—under one or more legislative authorities. If the objectives are to be attained in the time estimated—30 years—the problem becomes one of accelerating the various types of work in proper timing and sequence. To do this will require both careful timing in the availability of the required public funds and adeptness in using those that become available.

Too, it seems likely that in the computations back of the various estimates, the proportion of the total cost the public should bear has been overemphasized. Broadly speaking, for the work that really needs to be done, surely the public should bear the proportion of the cost inputs that represent "off-site" benefits. And landowners and operators should bear the costs for "on-site" benefits. There are numerous indications that the "on-site" benefits are greater than are generally recognized. If approached with reason and practical recommendations, the landowners and operators will apply and maintain a larger proportion of the needed work than if they are otherwise approached. The proportion of costs currently estimated as the public's share can probably be lessened as the measures and practices are applied.

The public is composed of *all* individuals and interests. It carries on its endeavors through units of government. The people, through their state, county, municipal and other local governments, stand to benefit from the proposed work being performed. Units of

government other than the federal should, therefore, proportionately share in the work that is done. It is entirely probable that current estimates have under-emphasized what should rightfully be done by the members of the partnership represented by units of government other than federal.

The old axiom relating to the whole and its parts is equally applicable to the Basin. Sound conservation analysis and action for a region of this size and complexity must encompass several physical areas of progressive inter-dependencies.

1. The watershed.
2. A sub-watershed (or major tributary).
3. A minor watershed (or minor tributary).
4. The very small watershed including a few such tracts.
5. The individual tract of land—farm, ranch, road right-of-way, etc.

The predictable effect of some measures may be nearly all "on-site," the effect of others may be partly "on-site" and partly "off-site." And still others may be entirely "off-site" or downstream from their location. While the agricultural plan, of course, failed to describe all the problems and solutions in realistically clear perspective, there is a tone of interdependence between the work and activities recommended that is somewhat uncommon. Hence, to the degree that the plan is carried out, it will be useful as a guide to facilitate integration of the various activities and types of work.

Considerable progress has been already made in getting conservation on the land. Close to 400 soil conservation districts have been organized covering about two-thirds of the Basin. Thus far, these districts have helped farmers and ranchers bring under conservation management around 40 million acres. Of these, about 25 million acres have been completely treated with a good conservation program safeguarding the productive capacity of the land and increasing the efficiency of farm and ranch production. And, about 600 thousand of these acres represent intensive irrigation and drainage practices. The remainder involves practices and measures for conservation of soil and water, proper management of soil, crops, range, woodlands and includes also the conversion of approximately $1\frac{1}{2}$ million acres from crops to grass or other permanent cover.

The formation of these districts has taken place during the last twelve years. Their accomplishments in large part have occurred

during the last five years, and progress of the movement can be said to be most encouraging.

While the type of work just mentioned has considerable "off-site" benefit its primary effectiveness is on the land where it is done. The other phase of upstream conservation—with the objective of retarding runoff, of increasing infiltration, of stabilizing small water courses, and reducing sediment damage on land and in reservoirs, and of other downstream values—has just begun. Historians are likely to say that the '30's and '40's were a period during which we went through the mental throes of understanding this concept and developing ways and means for doing something about it. (By way of parenthesis I add, many of you will recall that only about two decades ago did we begin to really try to do something about the conservation of the nation's land—especially the privately held farm and ranch land. Now, conservation is generally accepted and the common statement is that accomplishments need to be speeded up.)

At present, this second phase of conservation work is being carried on in the Basin with particular emphasis only on the Little Sioux Watershed consisting of some 4000 square miles in Iowa and Minnesota. Work is underway in 17 of its sub-watersheds. Both phases of conservation work are being done as an integrated job. Conservation treatment and use of the land, and small flood-water retarding structures, measures for the control of headcutting gullies, and other measures for stabilizing small watercourses all become integral parts of a single job. Twelve soil conservation districts are taking part in this undertaking. The district commissioners—as district governing body members are designated in Iowa—have organized themselves into a watershed working committee to determine priority of sub-watersheds and to properly relate the work in each sub-watershed to the work in the others.

It takes time for farmers and ranchers to understand their land and water problems, to organize themselves, and to make the decisions they need to make in order to move the work along in an orderly fashion. In developing approaches for attaining conservation and development objectives in the Basin we must not overlook our cherished system of private land titles under which is held, in fee simple titles, a large proportion of the agricultural land, including range and woodland. Those holding title may be intensely interested, or have no interest in the success of their tract. They

may live on the farm, or in a nearby town, or thousands of miles away. Soil, slope, topography and climate vary from one section of the Basin to another and from farm to farm or ranch to ranch. The desires, aptitudes, likes and dislikes of individual farmers and ranchers also vary from unit to unit. And so it is that the conservation and land use practices applicable on one farm in the upper part of the Basin are not likely to be either practical or effective in the lower part—or perhaps even on an adjoining tract. The conservation practices and land uses must fit the land and at the same time suit its owners and operators.

The meanings symbolized by the first three words of the Constitution of our Nation, "We the people . . ." are at work and are bringing about the conservation and development of the Basin. The problems confronted are many and complex. Progress is rapid but the job is big. Attainment of objectives will require many years.

AN ENGINEER'S APPRAISAL OF THE MISSOURI BASIN DEVELOPMENT PROGRAM

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IN CONSIDERING the Missouri Basin Development Program from an engineering aspect, it seems almost impossible not to touch upon certain other aspects such as economic, political, and social considerations. Engineering considerations must always take into account various other influences. Any good engineer will recognize these influences and temper his engineering decisions to some degree in accordance with those outside influences. However, these outside influences should never be allowed to predominate to the point where good engineering becomes secondary.

The Missouri Basin Program is certainly of national importance in many ways. The economy of the area will always be a vital factor in the economy of the nation. The bulk of the expenditures being made for development come from the federal government, yet has any economic analysis of the program, from a national point of view, ever been made? Is it desirable to carry on the program at such an accelerated pace during this particular national economic level? Do we need increased production, in some cases costing hundreds of dollars per acre, at this particular time when we find it necessary to have price supports on farm products at a high level?

Soil erosion is depleting the productive capacity of the Basin at a rather alarming rate. In order to maintain and increase the productive capacity, it seems logical that soil conservation measures should occupy a high priority in any development program for the Basin. Strange to say, this matter has received serious consideration only in recent months and very little work has been done to accelerate the program of soil conservation. On the other hand, irrigable land represents a potential productive capacity that does not deteriorate when not in use and can be brought into use at the proper time to bolster national production when it is most needed.

It seems that the first requirement for the Missouri River Basin is to enhance the economy of the region to the point where it becomes a national asset rather than a national liability. I seriously question whether the development program, as it is now being carried out, will of itself accomplish this. I see very little attention being given to industrial development. Industry is certainly one

important factor in developing the potential economy of the Basin. Power produced from the development program may constitute some inducement to industry but of far greater importance are transportation costs, markets, capital, labor, and industrial know-how. I see nothing in the present program that gives serious consideration to any of these factors. There are many other resources such as minerals and forests which are not receiving the attention they should in the program.

One must conclude that, from an engineering standpoint, the planning and execution of the Missouri Basin Program is almost entirely backward. The reasons for this are many in number and varied in character. In the first place, this nation continues to grope blindly for want of a suitable comprehensive national policy with respect to resources development. Hence, as a nation, we are totally unprepared to squarely face a problem of the magnitude of the Missouri Basin Program. The engineering features contained in the Program were planned by various agencies which by law are restricted to narrow objectives. The Program was authorized by Congress hastily as the result of a wave of hysteria resulting from the floods of 1943 and 1944 and of the rising tide of sentiment for a Missouri Valley authority. It is true that the projects authorized had been under consideration and analysis for a number of years, but always with limited objectives in mind.

The first logical step in planning a River Basin Development Program is to take an inventory of the resources and problems and then list them in the order of their relative importance. Planning should then proceed as nearly in accordance with this listing as practicable. This has not been done to date in the Missouri River Basin.

Engineering for the Missouri River Basin Development may be divided into four phases. The first phase is the engineering planning. The second phase is the design of engineering structures. The third phase is the construction and the fourth and last phase is the operation of the completed structures. A large part of the planning has been done although I expect some of it may have to be redone. Considerable design of specific structures has been accomplished and we are in the process of carrying on the construction at a rather high rate. Operational problems to date have not been encountered in major proportions, but they will surely come. In my opinion, the planning phase is the most important of all the engineering

tasks presented. I think, perhaps, this has been the weakest of all the engineering work.

Engineering design has become a rather set mathematical science. Construction under American engineering direction is something that the whole nation can well be proud of. Operation becomes a matter of making the most of the physical conditions at hand. Operations problems can become extremely difficult if the planning and designing phases have not been properly carried out. For instance, if a flood control reservoir has not been properly planned for use with other reservoirs in a system or if the design capacity is insufficient, certainly operation of that reservoir becomes an extremely difficult matter. If irrigation storage is not properly placed, or is inadequate because of insufficient data on available water, the operating engineer again takes a beating. Certainly, if irrigation storage is constructed without a thorough knowledge of the soil to be irrigated, considerable difficulty may be encountered. Likewise, if drainage problems are ignored on land to be protected by flood control reservoirs, or a system of reservoirs, release from the reservoir may well cause trouble. If a stream flows from three-fourths to bank full for a long period of time as a result of release from a flood control reservoir, or a system of reservoirs, the land adjacent to the stream cannot be properly drained and crops will die just as surely as if they had been covered for a lesser period of time by flood water. I am firmly convinced that some of the land which is now considered to be irrigable and on the basis of which irrigation storage is being considered, may later prove to be unsuitable for irrigation. I am also convinced that insufficient attention has been given to land drainage in general and especially on land below flood control reservoirs.

Some \$350,000,000 has been spent on the Missouri River under the name of river navigation. Yet, to date, there is no appreciable navigation on the river—certainly no amount commensurate with the expenditure of funds that have been made during the last twenty years. I am "from Missouri" on the question of navigation on the Missouri River. I think it would be a fine thing if it would develop to the point where it would completely pay its way. I question whether this point will be reached and I question the engineering feasibility of producing a navigable channel that will encourage the use necessary to offset the cost. I especially question the open-channel methods now in use.

From strictly an engineering point of view, the present laws pertaining to power distribution are not satisfactory. The shortest possible transmission distance from the point of power production to the point of consumption is the situation which the engineer likes to see. Distribution losses can thereby be kept to a minimum and the maximum amount of power reaches the consumer. Under existing law, public bodies such as municipal distributing bodies and power cooperatives receive first priority in the purchase of federally produced power. Hence, in order to reach these public bodies, longer transmission distances than would otherwise be necessary will frequently be encountered. I further question the adequacy of these laws from a political and social standpoint.

I am amazed at the popular misconception as to what the Missouri Basin development program will accomplish. There appears to be a feeling that a huge expenditure of Federal money in the Basin will automatically insure prosperity regardless of how the money is spent. Some people pretend to believe that the program will eliminate droughts, floods, blizzards, and grasshoppers. People of high standing have been led to believe that construction of reservoirs in the upper part of the Basin will almost entirely eliminate floods in the lower river. They consider that the upper states are making considerable sacrifice for states in the lower part of the Basin. As a matter of fact, if all the reservoirs planned outside of Missouri and Kansas were constructed, the people in the lower part of the Basin would find it difficult to notice any difference in floods. I say this in spite of the large flood reductions that have been accredited to the Fort Peck Reservoir. Any honest engineer who knows anything about the hydraulic characteristics of floods would not claim that a given reduction of peak flow at a certain reservoir site would carry undiminished for hundreds of miles downstream.

There is widespread misunderstanding as to what a soil conservation and improved land management program in the Basin can accomplish. The major physical benefit from a good land management program accrues to the land on which the program is placed and not from any off-site benefits. I wish to repeat that statement. The major physical benefit from a good land management program accrues to the land on which the program is placed and not from any off-site benefits. If there were a hundred percent participation in an optimum land management program throughout the Basin, the effect on floods in the lower main stem of the Missouri River

and its major tributaries would be so small as to not be measurable. There are technical computations and results of research which will verify this but which I do not have time to elaborate on here. Please do not get the impression that I am opposed to such a program. I strongly recommend that an improved land use program be initiated, or perhaps I should say accelerated at the earliest possible date. I urge this because of the great benefit such a program would be to the land on which it is placed and not primarily for any off-site benefits it would bestow.

Some experts, in their enthusiasm for "holding the water where it falls," may run head-on into state water laws in the upper states of the Basin. Some of the water they expect to trap and use where it falls may already be allocated by law to downstream users.

The destructive effect of silt on some of the large reservoirs planned and under construction should not be minimized. However, I find that the seriousness of this problem is frequently very much exaggerated. As far as possible, soil should be retained in its original position on the land. Beyond this point, it is frequently more economical from every point of view to trap it in large reservoirs than it is to install costly supplemental works to keep it out of the reservoirs.

Perhaps this paper has been pointed too much toward criticism of the Missouri Basin Development Program without much of a constructive nature. However, the magnitude and economic implications of the program seem to call for all the honest and straightforward thinking of everyone. I feel that we have not done enough of this. The Missouri River Basin Program, if properly planned and executed, can be of tremendous benefit to the national economy. The mere expenditure of federal money will not insure its success. Unless the states and the people of the Basin recognize and assume their responsibilities rather than depend entirely on the federal government, the program will be a miserable and costly failure. The economy of a region depends on the resources of that region and how fully and wisely the people use those resources. Government can provide some stimuli and assistance, but beyond certain limits, it is ineffective. It is ultimately up to the people of the Basin to "carry the ball."

NEW DIRECTIONS FOR LAND ECONOMICS RESEARCH: WEST

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TWO related but dissimilar approaches to this discussion are available. One—the more usual—rests on advancing a formal definition of land economics in order to distinguish it from other fields of the parent discipline “economics” and to follow this definition by a break-down of land economics into sub-fields with a listing of research needs under each sub-field. In such an approach, fine-spun distinctions with hazy boundaries are common and terms such as “land utilization,” “land classification,” “land settlement” and the like, the content and meaning of which are nebulous and more conducive to argument than to agreement among research workers, will be found liberally sprinkled through the discourse.

The other approach—the one I will follow—starts with the common sense knowledge that there are distressing economic problems in our western society that have their roots in the peculiar structure of the western natural environment and in the institutions man has erected in the West for guiding his behavior in the utilization of that environment. The focus in this approach is on *problems* thus rooted in the “land” and in “landed” institutions. Whether all of them are problems that fall clearly within the logical categories that might be advanced in the first approach is totally unimportant. The problems are there; they must be tackled by somebody interested, trained and experienced in their analysis. Whether such investigations are entered into by organizational units carrying “land economics” in their title or by specialists dubbed “land economists” is solely an administrative question private to each research organization. The crucial matter is to recognize the existence of the problems that may be called “land economic” problems and to assign men of appropriate qualifications to their investigation.

The discussion that follows will be concerned with land economic *problems* peculiar to the western United States. They are problems that warrant consideration under the heading “land economic research” only because they have a common source in the peculiar

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structure of the western natural environment or in the institutions man has erected in the West for directing his behavior in the utilization of that environment.

Problems Rooted in the Structure of the Environment

The physical environment of the West exhibits peculiarities of great economic consequence. Much of the land economics research in the West must, if it is to come to grips with the crucial facts of the environment, be directed to such problems as these environmental peculiarities create. They will be discussed here in three categories: (1) Those problems that grow out of a fluctuating, semi-arid climate; (2) those that grow out of the peculiar inter-relatedness in production of resources located at widely separated geographic points; (3) those created by the peculiar importance of "multiple-use" of much western land.

The economic consequences of a fluctuating semi-arid climate. If the question were asked, "What single environmental condition is most characteristic of the western United States?" probably most persons would reply, "aridity" and some would add the adjective "fluctuating." Yet much of our research into the economics of resource utilization rests on "soil surveys" or on "soil and slope" classifications. Rarely, except as to areas distinguished by the amount of rainfall, do we relate our research to crucial climatic differences.

Frequently of greater importance than soil type or slope and always of at least equal importance in the triumvirate of soil, slope and climate, are such factors of the climatic environment as amount, seasonality, time, intensity, and variability of rainfall; humidity and evaporation rates; and levels and variability of thermal energy. Admittedly the shortcomings in our economic research related to climatic factors are due in part to shortcomings in the basic physical data. Probably we economists should prod the natural scientists into giving us better basic climatic data. But in the meantime we should undertake research into the economic significance of climatic phenomena. We should not hesitate to get into analyses of basic climatic data ourselves. The work begun by Dr. Marion Clawson in the variability sequences of rainfall in the West¹ should

¹ Clawson, Marion, "Sequence in Variation of Annual Precipitation in the Western United States," *Journal of Land and Public Utility Economics*: August 1947, pp. 271-287.

be carried further and greatly broadened to embrace other climatic factors, and the economic significance of the variability patterns developed should be explored.

We need to do a great deal more research on climate and the delineation of "climatic patterns." We need to investigate their economic significance; their relation to entrepreneurial risk and uncertainty; their bearing on economic stability. We need to explore means for attaining and maintaining economic stability in a region of climatic instability. How can firms "roll up and unroll" like a corn leaf to survive in the face of climatic changes?

The economic analysis of the inter-relatedness in production of geographically separated resources. Agricultural land resources in all areas of the nation exhibit a pattern in which the characteristics of the resources at one point are different from those at another point. But only in the West are these resources, though at widely separate points, commonly organized into single agricultural economic entities. In the West acute economic problems arise because the characteristics of the agricultural resources associated in a single firm are often widely variant and frequently are not combinable at all or only with great difficulty in proportions that permit maximum productivity. Typically in much of the West, the "firm" in agriculture is not a localized geographic unit. Often different types of grazing and hay lands must be associated in a single firm and geographically they may be located many miles apart. The pioneering study of sheep migration in the inter-mountain region by Hochmuth, Franklin and Clawson is a good example of an excellent start in research into this problem.²

Irrigation farming exhibits the same characteristic. The tillable area usually is located at long distances from the source of the water that may be the limiting factor in the economy of the firm. We need to investigate the economic consequences of this condition relative both to the firm involved—its risks and uncertainties, costs and returns—and to the community's and society's concern over the wastes and inefficiencies in the use of water that may arise due to this wide geographic separation.

There is a growing tendency in the West to combine irrigated and dry land resources in a single firm even though they may be miles apart. What are the economic causes and consequences of

² H. R. Hochmuth, Earl R. Franklin, and Marion Clawson, *Sheep Migration in the Inter-Mountain Region*. U. S. Dept. of Agr. Circular 624, January 1942.

this development? To what extent should public policy in development of irrigation recognize it in its plans?

The economic analysis of multiple-use of resources. Nowhere else in the United States does the multiple use of resources have the economic impact it has in the West. This condition is probably a corollary of the condition discussed just previously—that resources used by single firms are frequently not geographically localized—and is also probably a result of the extensive federal ownership of resources in the area—a condition to be discussed later. But all agricultural economists in the West recognize the complex and difficult economic research problems posed by the phenomenon of multiple-use. A single area may be used for grazing by domestic livestock and by game for the hunter, for water production for domestic use and irrigation, for water impoundment for irrigation and flood control, and for recreation. The joint, competing and complementary economic relationships are baffling and obscure but terrifically important. In the West we need, as we need nowhere else in the United States, research into the economic evaluation and the economic consequences of this phenomenon. We need research that will serve as a guide to the public agencies in making their difficult but necessary decisions as to which use or combination of uses in a given area creates the greatest economic return.

The problem is difficult. But we should not pass it by for that reason alone. Only by making a start someplace will paths through the tangle open up before us.

To summarize this section of the discussion, most of that economic research usually called land utilization, or land classification, or type of farming research should in the West be addressed to problems flowing from three significant peculiarities of the western environment—its variable semi-arid to arid climate, the widely separated resources frequently composing or required for the composition of single firms and the multiple-use of much of the West's land resources.

Problems Related to Institutions Erected to Guide Man's Utilization of the Environment

Here in the West our utilization of the environment is guided by a structure of institutions basically the same as those in the United States as a whole. But they exhibit many peculiarities related to the underlying peculiarities of the environment already discussed.

Land economic research in the West should concentrate on these peculiar western institutional differences. For example, private property in land is the basic land institution in western agriculture as elsewhere. But public property in land occupies a more prominent place here than elsewhere in the country. Also, "private property" in water is a vastly different thing morphologically, physiologically, and therapeutically than is private property in the land surface. These peculiar differences in western landed institutions should be reflected in western land economics research.

Research in water rights and water law. Elsewhere in the United States we have research in "land ownership." Generally such research is concerned with the human behavior content and economic significance of ownership and tenancy. It distinguishes various kinds of ownership and tenancy and their relations to resource utilization; it describes the economic and social status of the individuals who compose the relationships; it analyzes the economic relations established between the individuals caught up in the tenure restrictions.

Here in the West private property in water is a crucial and critical aspect of our institutional structure. But research into water rights and water law in any degree comparable to that into property in the land surface is noticeably lacking. We need to devote a great deal more of our attention to describing the content of water law in terms relevant to human behavior, to research into the human behavior and human relationships that flow from water law, and to the economic analysis of water rights. We know as little about the behavioristic content and economic significance of water rights today as we did about property rights in the land surface a generation ago. If land economics research is to get hold of something vital in the West, it must tackle the "property in water" problem.

A listing of suggestive focal points for research into water rights may be helpful.

1. A description of the significance of water rights in terms that bring out their "control, liberation and expansion" of human behavior in the use of water and land surface. To whom do the restrictions and liberations apply and with what economic consequences; what are the magnitudes and costs of the risks and uncertainties of the entrepreneurs and other beneficiaries of water rights?
2. What are the inter-individual, inter-area, inter-state relations and conflicts implicit in water law? What are the inter-use conflicts of water that grow out of the content of water rights?

3. What are the "costs" of water—the "value" of water—in various situations and under various rights? What are the relations between "costs" of water and the "value" of other resources used in conjunction with water, notably the land surface?
4. What are the relations of water rights to resource utilization, to entrepreneurial costs and returns, to social benefits and costs, to efficiency in the use of resources?

In these, and in other focal points that could be mentioned, only the surface has been scratched by economic analysis—frequently the surface is unmarred. Land economic research in the West has a wide open field and a great opportunity in advancing understanding of these problems.

Economic analysis of the public ownership of resources. Nowhere in the United States is the public ownership of resources as widespread as in the West. The land area of the 11 western states is 54 percent in federal ownership; on this area is a significant portion of the supply of merchantable timber and of the grazing resources, and well nigh all the recreation and sources of water for domestic, irrigation, power and navigation uses. These cold statistics do not tell the whole story. Of more vital importance from the standpoint of research in land economics is the further fact that much of the resources on these federal lands is utilized by private entrepreneurs for their private profit. Here is another of those situations peculiar to the West—publicly-owned resources utilized by private enterprise. Where, elsewhere, land tenure research has been concerned with "landlord-tenant" relations—meaning always *private* landlord-tenant relations—here in the West this problem is predominantly one of *public* landlord-private tenant relations. At first glance by the uninitiated, this would seem to be a distinction of academic importance only. But upon analysis a host of intriguing differences come out that lead one almost to the conclusion that it is a wholly different problem.

Just what is and, of equal importance, what ought to be the landlord-user relation between the public agent and the private entrepreneur? What are the freedoms and the restrictions placed by the relation on the behavior of the public agent on the one hand and on the private user on the other? How is the relationship established and maintained? What are the "risks and uncertainties" experienced by the private entrepreneur and by the public administrator? What are the economic consequences to the private entre-

preneur on the one hand and to the public on the other? How can the relationship be established and maintained to the maximum benefit of all parties concerned?

Strictly from the standpoint of the economics of the firm, the problem presents intriguing facets for study. What is the economic impact on the dynamic planning of the firm of the risks and uncertainties peculiar to this different kind of landlord-tenant relation? What economic consequences on entrepreneurial decision, on the combination of resources in production and on the value of privately owned resources flow from the fact that "rents for grazing" on federal lands are administered prices rather than competitive market prices? On the other hand, how can the interests and values of other users of the services of the same land and the interest of society in the maintenance of productivity of the resource be adequately protected?

Research in this field has barely commenced. Little if anything was done on it before two years ago. Now the Western Agricultural Economics Research Council is sponsoring a regional research study of the problems of "public land management" in the West. To date California, Nevada, Utah, Colorado, Wyoming, and Montana and the Bureau of Agricultural Economics have expressed a keen interest in undertaking research in this field. Work has actually commenced in California and Utah.

Another aspect of the problems growing out of the public ownership of land in the West is the impact of public ownership on the fiscal condition of local governmental units. Where and under what conditions does federal land ownership place a fiscal burden on local government? Where and under what conditions does it aid local fiscal conditions? What arrangements might enhance the favorable and reduce the unfavorable effects of public land ownership on the fiscal condition of local units of government?

Economic problems of settlement on new irrigated land. Vast new areas of irrigation are either now opening up for settlement or are planned for the near future under extensive "river basin" development programs in the west. Perplexing questions related to the financing of such settlement are unanswered. Traditionally on federal projects, the government has placed a tract of raw land in the settlers' hands and installed the facilities to deliver water to the high point on the tract. From there on, clearing, levelling and subjugating the land, erecting buildings and fences, putting down

wells, constructing "on the tract" irrigation works, equipping the place with machinery and livestock and providing a livelihood for the family over the few or many years that all of this may take is the entire responsibility of the settler. Either the settler must come to the project pretty well heeled financially or it means a serious burden of debt. Or the finally "successful" settler may have benefited from the investments of time and money made by previously "unsuccessful" settlers. As in all such situations where heavy investments are needed, the pressure of interest charges and the risks and uncertainties of debt operating either through the unwillingness of creditors or the reluctance of debtors or both, results in an uneconomic limitation on investment. Such limitations on investment often accrue to the detriment of the settler and the public through uneconomic production and slow repayment of irrigation costs. The question posed is what sources, kinds and amounts of credit are best adapted to the job. Government development before the settler is put on the tract? Direct government loans for development? Private loans guaranteed by the government? Or should we go ahead in the future as in the past? Comparisons should be made between irrigated areas where various means of financing have been used. Comparisons are particularly possible between no development and full development because full development was practiced on the Wheeler-Case projects constructed before and during the war whereas no development has been traditional on Bureau of Reclamation projects.

These are the new directions for land economics research in the West. The starting point for these new directions is any socio-economic problem arising directly from the peculiarities of the physical environment or from the institutions erected for guiding use and enjoyment of that environment.

SOME NEW DIRECTIONS OF LAND ECONOMIC RESEARCH IN THE NORTHEAST

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THE directions of research discussed in this paper concern problems associated with:

1. The "urbanization" of the open country.
2. The retreat of the extensive margin of arable farming.
3. The geographic localization of farm income differentials within areas suited to farming.

The first of these phenomena is relatively new in many areas. The other two are older, but research methods and ideas for meeting problems are changing.

The "Urbanization" of the Open Country

I refer here to problems arising from the development of a non-farm segment within open-country populations. Issues raised by concentrated urban expansion along rural-urban fringes are not included. The urbanization of the open country is less spectacular, but has far reaching implications. In New York and a number of other states a majority of the working people in many rural communities are not employed on full-time commercial farms operated under their own direction. A large number of these nonfarm people are employed in manufacturing, trade, and service industries at the present time. When these employment opportunities contract, many of them will be in the same position as similar workers in the cities. Some hope that a small acreage—often of poor land—can provide them protection against a depression. Most will be disappointed, as they have been before. Full-time commercial farming no longer is a business one drifts into and out of in response to variations in an off-farm job.

Most nonfarm open-country residents live in an economic world distinctly different from that of their farmer neighbors. They are, nevertheless, a real part of the rural community. They own part of its tax base, drive over its roads, send their children to its schools, and share generally in the community life. Many of them were raised on farms, so they are at home in farm surroundings even though they are no longer in the farmer's economic world.

How can people in different economic worlds live together in social harmony and economic justice under these circumstances? How should they share tax burdens? How can agricultural service agencies serve part-time as well as full-time farmers? What urban service agencies might extend their activities to rural people in the urban economic sphere? How can the nonfarmers, especially the "agriculturally disinherited" among them, be made aware of the difference between farming to reduce living costs and farming that can compete on a commercial basis? How can everyone be made to realize that the gulf between the economic worlds of nonfarmers and farmers is wide, even though both call the same community home?

These questions indicate an area of research opportunity. Not all of it lies in the field of Land Economics, but a share of it is here. The area is not an entirely unexplored one. There have been studies of rural community adjustments to urban influences, of the relative merits of urban and rural homes for city workers, and of part-time farm operations. The subject needs to be re-examined, however, from broader points of view. Studies now are under way to identify and count the members of important segments in the open-country population. This is the first step and one that cannot be by-passed via Census data. Recent publications report such counts in New York and Illinois. In parts of four scattered counties in New York only one-quarter to one-third of the open-country residents operate full-time commercial farms by even a liberal definition. The Illinois publication reports that in one southern county of that state only one-third of the household heads in the open-country are employed solely in farming. These studies are a beginning in a potentially important area of investigation.

The Retreat of the Extensive Margin

Experience indicates that land abandonment is a continuing process in the Northeast. Observation indicates that we have not solved the problems raised by this process where it stood ten years ago. These problems are quiescent now because of economic forces outside our direct control. They certainly will be outlined in bolder relief in the near future, and we will be worrying again about the fate of some of the identical parcels of land so much discussed last time.

The abandonment of land once used for full-time commercial

farming in states like New York appears to be much less the consequence of soil erosion, mistakes in land settlement and farmer ignorance of optimum factor combinations than the consequence of technical and scientific progress. This progress has increased yields most where yields already were highest and cut costs most where costs already were lowest. It is an accident, perhaps, but in this part of the country, progress has not greatly disturbed the relative economic-opportunity positions of various grades of land. It has stretched, however, the range of the economic-opportunity scale. We can reasonably expect a continued stretching of this scale in the Northeast, and expect land as well as agricultural workers to be technologically displaced in the future.

Some claim submarginal land does not exist. This is quite possible in pure logic where the land market is made perfect, where there are no skewed distributions in command over capital, where buyers and sellers of land are omniscient, and where taxing processes operate ideally. In the real world, little land that has passed by default from fulltime commercial farming can be used by private individuals in any way now known to obtain going rates of return on normal investment and labor. I am forced in honesty, however, to say that most of the abandoned land is in private hands today and that most of the taxes on it are paid in full. Whatever in the way of an economic skeleton still exists (outside of the houses) is supported in a large measure by capital replenishment from outside. It is when this replenishment stops, as it must in a depression, that submarginal land problems reappear.

What is to be done? The biggest job is teaching people the nature of the land abandonment process. It is easier to explain nuclear fission to many persons than it is to explain land abandonment—they have fewer preconceived notions about nuclear fission. Men believe in the land they live by, even though they do not live by it very well. They also find it difficult to concede that new machines, plants and animals, by which poor land can be made to produce more with less human effort, can make that land worth less on the economic scale. These things can be taught, however. We also can teach the techniques by which differences in land can be identified and their significance spelled out. The teaching of these things can help to dry up the capital replenishment that supports misguided attempts at farming, and supports artificially high land values and taxes, in what are now submarginal land areas. This, perhaps, can

open the way for the economic development of these areas by private forest, grazing, and other extensive land using enterprises. Then a claim for the non-existence of submarginal land can hold a greater share of truth than it does now.

Research can explore the economic possibilities of alternative abandoned land uses, examine alternative institutional arrangements affecting private enterprise on this land, and consider public enterprises that might be established in these areas. It has been recommended more-or-less as a matter of course that abandoned land be returned to forests, without a careful investigation of the economic returns promised by forestry. Forestry has been promoted as a religion rather than on the basis of hard economic facts. As a religion it has made meager progress in comparison to its potentialities. Economic facts may reveal the bottlenecks. Grazing, recreational and other extensive uses also can be investigated.

The Localization of Farm Income Differentials

Research to discover reasons for variability in incomes from farm to farm was begun in this country some years ago. It probably was recognized ahead of time that the functional relationships underlying this variability are very complicated. Progress has been made however, and various patterns of stochastic causal and associative relationship have been discovered. One of these patterns is geographic. Farmers in certain areas have been found generally to be making higher incomes over the years than farmers in certain other areas. It also has been found repeatedly that these income patterns often are associated with geographic patterns in such physical factors as soil, climate, topography, and location.

The land classification system now identified with Cornell University grew directly out of these findings in farm management research. This system has as its fundamental supposition the generalization that there are geographically localized differences in farm incomes within such areas as states and counties, that these are mappable at a reasonable level of categorical and cartographic detail, and that they persist long enough to give these maps a sufficiently long useful life to justify the cost of making them. It has as a closely related supposition the idea that localized income differences are associated with physical land differences. Numerous operating assumptions also have been necessary. These also have been based upon farm management research findings. The use of

the roadside farm appraisal (the widely known, so-called building classification) has involved one of these operating assumptions. In this case it is assumed that the evident appearance of a farm and its buildings is related to the income of the farmer. The fundamental suppositions establish the general character of the classification system. The operating assumptions are used in carrying out the classification processes involved in the system. Operating assumptions may be changed or replaced within limits without changing the essential character of the system. Actually, however, the distinction between fundamental suppositions and operating assumptions was not clearly recognized early in the classification work.

A variety of farm characteristics always can be found in any area that are related, causally or otherwise, to farm income. In New York State intensity of land use, as inputs per acre, is one factor generally related to farm income. There are others similarly related, but as it happened, intensity was chosen early in the classification work and explicitly advanced as the classification criterion. Among the other farm and land characteristics that are related to past and probable future incomes in various degrees, a group was chosen that offered the advantage of being easily ascertainable, usually on rather rapid visual inspection. These were termed the "bases" of classification. They included principally the outward appearance of farms and farm business, kinds of crops and other vegetation on the land, soil characteristics, and assessed valuations. These particular farm and land characteristics were found to be suitable indicators of farming success in the areas of the state where classification work was begun and were made a part of the classification routine on that basis.

Fundamental suppositions, criterion concepts, and operating assumptions were confused with one another in the standardized classification routine that crystallized out of the early classification efforts. This routine was adequate in the areas where it was born, but is not suited to all major areas of New York. It is unsuited, moreover, to many areas outside New York, and workers elsewhere often have been unable to separate from it the ideas that might have been useful to them.

Regardless of the deficiencies we think we see today in the original form of the system, it, nevertheless, was outstandingly successful in the circumstances where it first was applied. It was simple, and at the same time portrayed differences farmers them-

selves could see when they stopped to look. I think this relatively simple device has contributed more to a general understanding of land use problems in New York State than any other single activity. The system also represented a fundamental departure from established land classification systems at the time it first was advanced and for this reason it stimulated basic thinking about land classification. Up to that time no major classification system had discriminated among levels of economic opportunity within major use areas. This feature of the system still seems to have no meaning to some land economists. I shall attempt later to show how an acceptance of traditional theories of land use and farming returns can cause a blind spot in one's comprehension at this point.

The recent re-examination of the system by workers at Cornell was prompted by the apparent unsuitability of the original routine in certain areas within the state and also by a desire to spell out the fundamentals of the system in a manner more widely applicable and understandable. In this they have drawn heavily on the work of men who have applied the fundamental ideas of the system to a variety of conditions both in the United States and Canada. Workers in Virginia, Canada and the State of Washington have contributed especially. Attempts also are being made to tie the system into traditional theories of land use and farming returns. This can provide logical shoring for inductively derived notions and a linguistic common denominator for those who approach land problems from established theory and those who approach them via the everyday problems of farm management.

As visualized now, the land classification methods being used at Cornell have more in common with farm appraisal techniques than with any other clearly identified process in this general field. The methods and the thinking go well beyond a mere estimate of probable sale price, however. They go into that area where lie part of the factors determining such things as debt repayment ability. In this respect, then, an application of the system parallels the work of a qualified loan representative, who not only estimates sale price, but also recognizes farm income differentials that lie beyond this. The land classifier, of course, tries to visualize a farm in terms of a farmer typical of the area, rather than to evaluate the ability and integrity of the individual farmer. His appraisals also are much more hasty and his results are recorded in a categorically and

cartographically generalized form. The intent is much the same, however. In fact, the land classification system now is referred to as an income-expectancy type of classification.

In this form, the large judgment element present in the system is obvious. It can be judgment objectively exercised, however, and surely is judgment in an area of immediate practical concern to farmers, farm lenders, agricultural service personnel, governmental agencies, and many others. With judgment elements clearly recognized and with fundamentals separated from expeditious adaptations, it is possible to critically analyze the system and to outline directions of thinking and research that offer promise of improving it. It is possible also to visualize the likely usefulness of the system in new circumstances.

First, however, we should clear up some inconsistencies between the fundamental suppositions of the system and established economic theory. As always, we must accept the theorist's disclaimer to exactness and complete generality. We must hold him, however, to portraying central tendencies in stochastic relationships through time and space, if he means to have his theories approximate real world situations. With this central tendency idea in mind, we can say that traditional theory categorically denies the possible truth of both the principle and associated suppositions of the income-expectancy system of land classification. In traditional theory, land either is made a residual claimant, or is attributed a marginally imputed share. In either case, non-land input factors are assumed to be mobile in varying degrees and to seek maximum returns across land grade lines. It is presumed, then, that these factors in time attain a substantial degree of equality in returns for equal input effectiveness everywhere they are employed. Types and intensities of land use are adjusted to equalize marginal productivities for all inputs in all directions of application. The land market capitalizes the share left for, or imputed to, land in establishing the market price of this input factor. All dollars invested in land at going market prices thus earn equal rates of return everywhere. In this body of reasoning, then, a farmer should receive neither more nor less for either his time or his capital than any other farmer, unless his time or his dollars are more or less effective input factors.

This theory leaves no place for persistent geographic localizations in farm income differences, except under some rather far-fetched

assumptions. The most often promoted assumption of this kind maintains that geographic differences in farm incomes within most limited areas are the consequences of geographically localized differences in the managerial abilities of farmers. There are both empirical and logical items of evidence to refute this notion. The idea appears especially out of place when one leaves the marginal zones and makes comparisons between high and very high farm income areas. Similarities in cultural and educational backgrounds, intermarriages for that matter, seem to rule out the likelihood of inherent differences in farmer abilities. If the differences are acquired, then there must be an external cause. Even not acquired there may be a sorting of managerial ability by grade of land. But why should differences in managerial abilities become localized without an external cause? If, indeed, economic opportunities are the same on all land, why should the more capable farmers gravitate to areas where soils are deeper, and the land naturally better drained, better watered, less steep or otherwise physically better suited to agricultural operation?

Actually it seems quite meaningful in the real world to consider the price a farmer pays, or promises to pay, for his farm as going a long way toward determining his degree of subsequent financial success, and then to focus attention upon the characteristics of the land market and of the participants therein. The land market comes far from embodying a theoretically perfect process, its participants are far from omniscient, and they come to it on widely unequal footings. Most farmers do not possess sufficient knowledge of land over wide areas to justify a contention that the prices they establish in buying and selling farms represent an accurately capitalized value of any explicitly recognized return. They do recognize some differences in land to be sure, but there are good grounds for expecting them to underestimate the actual differences and therefore to average their prices across land grade lines to a considerable extent.

There also is a highly skewed distribution in command over capital among farm purchasers. Many people have the price of a cheap farm, but few have what it takes to buy a high priced one. Almost certainly this skewed distribution in command over capital causes more intensive bidding at the lower end of the price scale.

Lack of complete knowledge and a skewed distribution in command over capital combine with desires to be "one's own boss" and desires for security, to produce an actual land market that is far

from the theorist's ideal. The discrepancies between the actual and the ideal follow a generally systematic pattern, however. They are such that degree of financial success in farming very commonly is an increasing function of land price. There are definite limits, however, to the generality of this relationship. Where differences in land are sharp and clearly recognized and where capital is equally available to the groups on each side of such land lines, this relationship ceases to hold. For this reason we often find equal economic opportunities between highly priced land areas in irrigation districts and cheaply priced lands in grazing areas above the high-line ditch. For this same reason, too, we find roughly equal average opportunities in farming between Wyoming and New York. Land in Wyoming is not confused in any buyer's mind with land in New York, even though land within either state may be confused with land farther down the road.

It is in this general fashion that the income-expectancy system of land classification is being tied into established theory and given logical support.

With this background let us turn to thinking and research that might improve the present income-expectancy system of classification. The following are possible directions such thinking and research might take:

1. Toward a more precise expression of what is meant by income expectancy.
2. Toward a re-examination of the suitability of various easily observed or measured indicators of income, toward a quest for new indicators, and toward refining techniques for stepping from indicator information to income estimates at the individual farm level.
3. Toward more precise technical definitions of land classes as cartographic groupings of farms.
4. Toward more systematic procedures for drawing the land class lines that create the cartographic groupings of farms, and toward devising and applying more refined statistical techniques in measuring the "goodness" of a given set of lines and in maintaining uniformity within land classes among widely separated areas.

The making of income-expectancy land class maps will remain a judgment process, in large measure, regardless of the thinking and research that is done. The classifier must add up a large

amount of information that can never be summed reliably in any mechanical manner. He also must look into the future if his work is to be most meaningful. Judgment processes can be ordered and aided, however, and the kinds of activities suggested above would help in this way.

Farming returns, and therefore farm income expectancy, can be measured in many ways. In land classification work the particular measure adopted may vary with the objectives and circumstances. In an area where farms are predominantly family-sized and owner-operated, the farm management measure known as "labor earnings" is likely to be appropriate. For land classification purposes, however, such a measure should be modified to span a period of years, perhaps the ordinary working life-time of a farmer. Generally, the measure chosen should be one whose values will be closely correlated with such things as debt paying ability and general level of living. For special purposes and in certain circumstances labor earnings per man would be a suitable concept. Other concepts may be appropriate in other instances. A "typical" or "modal farmer" concept also must be part of any expression of what is meant by income-expectancy. We do not classify land for specified individuals but for the "most likely" individual.

In any case, however, the land classifier will not often be able to measure even actual past incomes in the areas he classifies. He seldom has the money. Instead he must use easily observed or measured indicators. The appearance of a farm is such an indicator. Soils can be indicators; so can kinds of crops, size of farm business, rates of production, market value of capital, and other farm and land characteristics. These factors possess indicative value to the extent of their correlation with long-run incomes. They need not be causally related to income to be useful in the classification process. Their relationship to income need only be stable in a known space and time. It is obvious that some indicators are likely to be more satisfactory than others. The usefulness of an indicator depends on its cost, on the one hand, and its closeness of relationship with long-run incomes, on the other. An adequate interpretation of indicator information of any kind must rest upon a knowledge of regression functions. These regression functions need not be continuous and precise, but they must make it possible to put individual farms into significantly different income-expectancy categories.

At present there are no technical definitions of income-expectancy land classes. It will be very difficult to construct such definitions. Land classes are cartographic units and each unit nearly always must contain the full range of universe values if it is to be of reasonable size and not unreasonably awkward in shape. Land classes can be distinguished most meaningfully in terms of various characteristics of frequency distributions. They should not be distinguished exclusively in terms of one characteristic of these distributions—the arithmetic mean, for example. I believe that the task of defining land classes in technical terms offers a real opportunity for imaginative thinking.

The development of systematic procedures for drawing land class lines is an even more difficult task than the construction of land class definitions, though closely related thereto. It is strictly an art at present, even when individual farms have been assigned to suitable categorical income-expectancy classes and the corresponding designations noted on maps. In drawing these lines attention must be given to the spatial distribution of farms with different characteristics, as well as to the kinds of frequency distributions shown on the tabulator when the job is finished. Statistical measures can be used as partial tests of the goodness of a classification and may replace to some extent a need for systematic procedures in the drawing of lines. No statistical measures yet known, however, can reflect satisfactorily the spatial element.

It is possible to visualize a more "scientific" income-expectancy classification of land (perhaps we should say, of farms), but there are plenty of unsolved problems along the way.

I should not close this paper without pointing out explicitly that the income-expectancy system of land classification is not the long sought ideal that does all things for all men in all circumstances. There are instances where geographically localized differentials in farm incomes do not exist in a mappable pattern, cases where dispersed non-contiguous operations make mapping on a farm unit basis impossible, cases where major use issues are paramount and must be settled before any persistent pattern of incomes will crystallize, cases where institutional arrangements constitute the most significant limiting factors, and cases where the problems at hand involve helping a population on the land keep body and soul together in an unfavorable situation from which it cannot escape. In a number of widely separated areas, however, the system has

proven valuable. Maps made with it have helped many private individuals and organizations directly and have helped others indirectly by serving as guides in the formulation and promotion of governmental programs and policies. Such maps can help solve a general problem in so far as lack of information underlies differentials in economic opportunity upon the land.

Is the making of these maps research? I will side-step this by saying that a land classification program of this type often can form an important part of a departmental research program. It can identify significantly different strata for sampling purposes and it can aid materially in constructing the kinds of observational designs that are beginning to be suggested in farm management and related fields. It also can form a nucleus around which it is possible to organize ideas of what constitute optimum combinations of factors of production on various lands.

DISCUSSION

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Professor Conklin says that land economists in the northeast will be concerned with problems related to the urbanization of rural areas, retreat of the extensive margins of agriculture, and with land classification. Let us not condemn too readily the urban employee for wanting to live in the country. Although social security has improved his economic position, his real problem is that of maintaining urban employment rather than proper adjustment to his rural environment. He may need some help in understanding the limitations and possibilities of his part-time farming venture.

From Professor Conklin we have again heard about the "Cornell land classification system." (The fact that it is a farm classification system he parenthetically admits.) Drawing lines on a map around areas of good farms and around areas of poor farms may be a desirable starting point for research in land economics. Such a procedure graphically illustrates the occurrence of certain observed characteristics in much the same way that a bar chart graphically portrays the occurrence of items in a statistical array. The delineation of areas having certain characteristics is valuable for extension work and for other purposes. We do not need, however, to rationalize the making of a bar chart by referring to economic theory. It does not take a theorist to observe that some farmers have high incomes and some low even when the observation is made by visual inspection of his buildings or other assets rather than by an accounting system. It may take a good theorist, however, and painstaking research to discover why some farmer's incomes are high and others low.

Perhaps a fruitful way to consider what is new in land economics re-

search, at least in the West, is to consider the major trends in land use and landed institutions. In the West we have seen a rapid expansion of irrigated land in recent years and will see further expansion in the near future. Secondly, we have seen in recent years much greater control exercised over our public and private range lands and in the near future I think we will see a much more intelligent and intensive use made of them. These two major trends in the West should be of primary concern to land economists.

In the field of irrigation, land economists have much to do. We must study further the economics of organization and operation of irrigation districts and other institutions peculiar to irrigated farming. This list is not at all exhaustive. There are many other problems that need attention.

We have much to do in the field of the economics of range land use and control. Experiments to determine how we may practically increase the production of feed from range lands are of fairly recent origin. These experiments are showing rather startling possibilities. The economists have much to contribute in helping to determine how we can use range land more intensively. Problems of ranch organization and management are involved.

Land economists in the West must be aware also of the fact that government, all levels of it, is a more direct factor in the economic environment of western agriculture than in other regions. It is not uncommon for a western producer to deal with one or two or more government agencies to obtain grazing for his animals; he deals with another to help him control predators. He irrigates his land with water, the right to which is protected by the state. This water is brought to his place by a municipal corporation which collects for this service through the county taxing mechanism. This municipal corporation may, in turn, receive the water from a federal project or a public corporation. It is evident that the actions of government are a vital and determining force in western agriculture, as vital perhaps as the prices received and costs incurred in production. A new direction in land economics research would be to develop techniques for properly evaluating this factor in our economic analysis.

DISCUSSION

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In my discussion of these excellent papers I want to direct my remarks to making land economics research useful. In organizing and carrying out any research project many things can be done to facilitate the utilization of the final results. It is necessary to develop a clear idea not only as to *what*, but also as to *whose*, problems we are tackling; in other words, whose land use interests are involved and who the users of anticipated research results will be. This helps focus the analysis and aids in selection of illustrative materials that will appeal to the users.

Participation by people who live upon and use the land is of great im-

portance. As prime movers whose initiative and cooperation is essential in any program of land use adjustment they have an important layman's contribution to make in identifying the problem and assisting with certain phases of the study. I wish to emphasize this point above all others in these comments of mine. A close, progressive, working understanding between the man of science and the man of the soil is, I feel, of fundamental importance in paving the way for the utilization of research results.

In passing it is important to note that land economists can very properly carry on some research for the purpose of improving their own science; for example research work regarding such things as land classification, land valuation, the application of theories of location, and the character of institutions affecting land use.

Both papers stress the great importance of basic physical data. One of the fine things about the income-expectancy classification discussed by Dr. Conklin is its careful tie-in with soils and other resource data. Dr. Kelso's proposal for studies of the economic consequences of a fluctuating semi-arid climate should yield very useful information. Men everywhere in the West are intensely interested in the weather and its bearing on problems of risk, uncertainty, and economic stability. I feel that we need much more information on soils, especially expressed in terms of potential productivity under alternative soil management plans.

I was much interested in Dr. Kelso's discussion of the inter-relatedness of geographically separated resources. The factor of distance is important but so is the factor of *pattern*; the many area combinations in which resources occur. His suggestion for research into this problem in terms of agricultural operating units is an excellent one. However, since agricultural uses are often intermingled by areas and geographically with non-agricultural uses, an analysis of agricultural operating units might well be accompanied by an economic analysis of non-agricultural uses. I wonder if land economics research doesn't often neglect the economics of forest, grazing, recreational, and watershed use. Dr. Kelso in his discussion of the need for economic analysis of multiple-use resources, and Dr. Conklin in his discussion of important research opportunities in exploring the economic possibilities of alternative abandoned land uses point out this shortcoming quite clearly.

Recognition of legal institutions as factors affecting the use of land resources is most properly emphasized in Dr. Kelso's paper. An economic analysis is much more useful when accompanied by an analysis of the institutional framework within which economic activity is carried on.

Regarding the economic analysis of public ownership of resources I wonder if it wouldn't be more feasible to look upon the whole tenure structure as a *combination of public and private rights* and to analyze both types together. I feel that the goal we seek is a good combination of public and private use rights. The necessity for such a combination grows out of the varied character of our Western land resources, the natural overlapping of private and public interests at many points, and the natural, desirable, and inevitable intermingling of two or more types of use in many areas.

I was much impressed with Dr. Conklin's discussion of an income-

expectancy type of land classification. He indicated that this relatively simple device has contributed more to a general understanding of land-use problems and land economics processes in New York State than any other single activity. This indicates that this procedure is a useful reconnaissance way of looking at farms and at land in a systematic manner. I am familiar with a similar classification made in a number of Washington counties and I am certain that the maps and accompanying descriptions made there have been an eye-opener to many who were not aware of the great variation in soils and farm income from area to area.

Dr. Conklin makes a statement to the effect that the income-expectancy system of land classification is not the long sought ideal that does all things for all men in all circumstances. This leads me to make an observation of my own, namely that any one general land classification procedure, like any one general economic theory, is often inadequate or unsuited to a particular problem situation. I am inclined to look upon land classification as a type of tool the design of which must be varied, sometimes radically, to fit *the time and the place and the problem*. I feel, too, that any economic classification map is apt to be a broad generalization based on many types of information. Any generalized land classification map needs to be explained in terms of soils maps, type of farming maps, land use data and other types of specific information on which the generalization is based.

Dr. Conklin's discussion of the need for bringing up to date our knowledge of the urbanization of open country areas is certainly timely and his list of questions is an excellent one. This urbanization development is not peculiar to the East; we have Western versions of it in the Pacific Coast States; here in the Rocky Mountains, and even in desert areas in the Southwest and the Great Basin. I have long felt that we are too prone to divide the economic universe into two big subdivisions, "agriculture" and "industry," and to overlook a broad middle zone of economic activity and living that is some mixture of the two.

I agree with Dr. Kelso that the economic problems of settlement on new irrigated land are going to need a lot of attention. His discussion is largely in terms of public policy and program problems of financing development. In addition, as he indicates, there are many farm organization, farm management and family living problems on individual farms. Some progress has been made, some excellent research work has been done, but we still have a long way to go.

In reading the papers given here and in reflecting on the scope of land economics, I am much impressed with the fact that land economics is indeed a social science; perhaps the most social of them all. I say this because of the number of other disciplines with which the land economist is constantly in touch—ecology, farm management, sociology, political science, public administration—to name major ones. I understand that the modern trend throughout the world of scientific scholarship is to try to bring workers in the various fields of science into closer working relationships with each other on a team work basis. If this is true, then there is in land economics a point of view, a method of operation, and a background of experience that is very much in tune with the times.

DEVELOPING AND APPLYING PRODUCTION FUNCTIONS IN FARM MANAGEMENT

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PRODUCTION functions are being discussed with increasing frequency in economic and related literature. Actually, economists are adopting new terminology to express old ideas. In the mathematical sense, a function is simply a description of the definite relationship that exists between variables. Research in farm management has long been aimed at the discovery of such relationships. Outstanding examples are the studies in the 1920's by Dr. Spillman of the relationship of crop yields to fertilizer applications. Later, the pioneering work of Tolley, Black, and Ezekiel initiated input-output studies covering many problems. Dr. Jensen and co-workers in the field of dairy husbandry made a major contribution with their research on the relationship of milk production to feed intake. These studies and countless others, whether they used the terms production coefficients, crop and livestock response, or input-output ratios, all sought to establish relationships between variables so that prediction might be made with greater certainty.

Adopting the terminology of production functions has several advantages. As mathematics becomes a tool of the economist in the expression of ideas, it is helpful to adopt the definitions of that discipline. A common language assists in comprehension and solution of problems. Mathematical manipulation of a function is possible and leads to greater precision and facility in the use of cost curves. Total, average, and marginal cost concepts can be expressed and integrated. When the interrelationships of several variables upon a dependent factor is studied, graphics can no longer serve and the function equation must take its place. More and more often, production economists are asked to evaluate response when the influence of several factors are felt simultaneously.

Production functions are useful at several levels in farm management research. In the phase of agricultural policy that affects agricultural production, functions can be used to summarize the relationships between aggregate factors. This knowledge could be helpful in determining the impact of policy and the adjustments that might occur on farms, between farms, and between areas. Some attempts have been made to develop production functions

showing the relationship between organizational characteristics and farm output for groups of farms. Heady, Tintner, Brownlee, and associates at Iowa State College have published several papers dealing with this level of use. The most common level has been one concerned with crop and livestock response to variable conditions. Most of this work is well within the scope of the physical production scientists. Examples of such research are familiar to all and need not be elaborated here.

In farm management research and extension at Connecticut, we have taken the position that it is at this latter level—physical production response—that production functions can be of greatest help. True, such research lies within the technological sphere, but therein may be one of the greatest benefits. Farm management may be considered as an integrating vehicle for physical production data. By the application of price or cost information, input-output relationships can be appraised to determine combinations that will achieve given ends—efficient resource utilization or profit maximization within welfare considerations. Cooperation with the physical scientists helps to indicate to each group the problems and needs of the other.

The decision stems also from another tenet—that the grouping of farms on a type-of-farming, type-of-enterprise, size-of-business or any of the familiar bases used in farm management has generally failed to give help to individual farmers in their management problems. Efficient resource utilization, within the framework of the limitations that exist on each farm, cannot be achieved by resorting to the factors-affecting-farm-profits approach derived from group data. Across-the-board recommendations to increase crop indices, to decrease investment per animal unit, to enlarge the size of business, and the like, are in opposition to primary principles in economic theory and underestimate the individual management problem.

It was on somewhat similar grounds that we chose not to use production functions descriptive of organizational characteristics from groups of farms. If these functions are used to initiate adjustments on individual farms, the same criticism can be made as of the factor-analysis approach which tends to recommend the general application of specific management practices.

Farm management as a science and an art is a much more subtle problem. It is a tremendously personal problem, too. Each situation

is filled with human and environmental conditions that border on uniqueness. Yet if we assume rational action, we have available the economic theory and the mechanics to help meet this problem. Using physical production functions as our building blocks and applying price or cost data, it is possible to synthesize economic models. After they have been altered to meet real limitations that may exist on a particular farm, the models can serve as goals or objectives that indicate possible directions of adjustment. Also indicated are the changes that are necessary in resource organization and use, an approximation of the costs in terms of expenditures, an estimate of returns, and the impact upon personal value systems and existing habits. We believe such a program brings help to the individual farmer in his role as an entrepreneur. Alternative opportunities are set up and with each is associated the management practices that are required and the returns and costs in monetary and human values. With this knowledge each operator is then able to choose which alternative maximizes returns within his value system.

Having defined production functions and discussed their usefulness in general, and in particular for farm management research and extension in Connecticut, perhaps it is time to make a major confession. In my opinion, adequate physical production functions are not available now nor will they be in the reasonably-near future unless there occurs a marked change in agricultural research. Research on farm problems has been done at scattered points throughout the country. Scientists working within this framework have naturally worked on those problems of greatest interest to themselves and to farmers in the area in which they are located. As a result, spotty coverage has been given farming problems. Moreover, because of our propensity to classify and order, institutional segmentation has been established. Problems have been viewed in segments much as the blind men "viewed" the elephant. Agricultural engineers have been primarily concerned with structural strength of a barn, a silo, or a piece of haying equipment. Dairy husbandrymen have considered hay or silage from a feeds or feeding standpoint. Agronomists have attempted to develop more useful forages. These approaches are necessary and desirable but what is lacking is an integrated research plan. Lost somewhere along the way is the problem that transcends all others—the use of farm resources to achieve maximum profit.

Because of deficiencies in sampling, experimental design and control, and analysis, only fragments of input-output curves have been developed, and these fail to show the interrelationship of important variables. Practically none of the studies have pushed experimentation to the point where total output levels off at a maximum with continued application of inputs. Progress is being made in research on technological relationships, however, and in time economists may be able to assist on the problems of resource allocation and utilization on a farm through the medium of function equations. Until that time, assistance can come from a less refined and more time-consuming method—synthesizing efficient farm units by budgeting the influence of alternative set-ups with physical relationships based upon standards of performance.

A short discussion of a project we have recently completed at Connecticut in cooperation with the University of New Hampshire and the Division of Farm Management and Costs of the BAE may help to visualize this method. The study is entitled, "Cost Reduction in Dairying," and the purposes were to establish ideals in resource organization and utilization within present technological limitations and given price relationships, to determine areas wherein cost reduction opportunities lay, to summarize existing standards of performance on crops and livestock and point up the gaps that exist in these data, and to indicate the usefulness of this approach in farm management. The theory associated with the determination of economies of scale was used as a vehicle to achieve these objectives. This was done because the scale technique is almost a discipline within the discipline of economics. Agricultural economists could immediately construct the conditions impinging upon the study. Furthermore, the technique neatly accomplishes the several objectives. As the scale curve is drawn tangent to firm curves representing the most efficient utilization of resources at different size, it is necessary to collect and integrate physical response data. Gaps in the existing information are indicated in this process. The technique also sorts opportunities for cost reduction into those associated with changes in the size of business and those associated with the organization and use of resources in the business.

Synthesizing the farm business is dependent upon input-output data for segments of the production process. I call these data standards of performance because they are over-simplified versions

of production functions. They represent superior but attainable levels of accomplishment under precisely defined situations when many of the usual variables are eliminated. In later application to individual farm planning, it is possible to show how the performance rates are altered by introducing some realistic variations into the situation. But in synthesis, we used the unadjusted standards such as alfalfa yields of 6000 pounds of hay per acre from a medium productive soil subjected to specified treatments, total milking time of five minutes per cow per day for a given man-equipment-barn combination. Once these standards have been obtained for a sufficient number of segments, synthesis of the average cost curves and scale curve is possible. Achieving the most efficient combination of resources and practices from the numerous alternatives is accomplished by budgeting to recognize marginal concepts and interrelationships of adjustments. Gradually the farm unit takes form around one definite item, such as size of the labor force, to give firm curves for the farms of different scale.

For the most part, performance standards were obtained from the studies of agronomists, dairy nutritionists, etc. Some standards, particularly those dealing with labor and equipment use, were developed by agricultural economists at New Hampshire and Connecticut. In developing these rates, physical input-output relationships were studied either on vanguard farms or on experimental farms. An approach to controlled conditions was achieved even under a farm environment by breaking jobs down to elements which could be precisely defined and which were subject to repetition. A description of physical inputs and outputs and the conditions under which they operate was secured. Comparisons between and upon farms were then made to determine the highest production efficiency for each necessary element in the job under any standardized condition one might select. A performance rate, arbitrarily set somewhat below this highest level, was then derived for the production phase with an indication of variability around this rate due to physical differences in such things as hauling distances, stoniness, barn layout, operating speed, load sizes, etc., that will vary between farms from the standardized situation.

More valid comparisons can be made between labor-equipment combinations through the use of these standards than by using the usual average data. By combining element requirements derived from the most efficient operators, an approach to experi-

mentally-controlled conditions can be achieved. For example, usual average data for haying equipment reflect differences in field conditions, labor capabilities, equipment conditions and management characteristics, as much as they do the basic differences between equipment. The construction of standard rates minimizes such unwanted influences by eliminating some of the physical differences, and by using a selected sample. A basic assumption is that there is less variation in management characteristics between the most efficient operators of groups using different kinds of haying equipment than there is between all operators in the groups.

In the Farm and Home Planning activity of Connecticut extension work, these standards have proved very helpful. In the step-by-step adjustments on his farm, the operator has been able to visualize what levels of accomplishment were reasonable under his situation. Average rates, on the other hand, have a nebulous character which does not permit meaningful application to an individual problem.

The usefulness of standard performance rates as a device to improve farming practices is demonstrated by the spread of the rapid milking method. After studying this problem, standards were established that were related to the performance of those dairymen who were using superior techniques. The goals and associated practice recommendations were then made available to other farmers. By applying these methods, milking time has been reduced on many farms even though, in this case, there was the problem of training the dairy cow as well as the dairymen. Another example shows how standard performance rates and associated techniques were used to improve hay-harvesting methods on an individual farm. After studying the problem and comparing his own operations with those which are recommended, the operator in this case was immediately able to reduce by 30 percent the time required to move one load of hay from the field into the mow. By making alterations in the barn and adding other installations, the time per load could have been reduced to 45 percent of the original requirements.

In summary, this presentation has emphasized that production functions are basic tools in farm management research. Although they can be applied at several levels, we believe that they are most helpful when used to express the interrelationship of input variables upon output in crop and livestock production. These data are necessary information when economic models are constructed to

assist the individual farmer by indicating possible directions of adjustment and the steps in achieving these objectives. Inadequacies in existing physical input-output relationships warrant the use of a less complex type of function which we have called standards of performance. These standards have been very valuable in farm planning to initiate individual adjustments.

Throughout this paper, emphasis has been upon the role which farm management plays in achieving adjustments on individual farms. We believe this is a necessary starting point before we can attack the broader problems of intra- and interregional competition, and of resource ownership and control. We believe that these problems along with the individual's management problems are met best by concepts of what could be rather than what is. Therefore this is the area and the methods we have chosen for our work in farm management research.

MEASURING THE MANAGEMENT FACTOR

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IN THE analysis of farm financial data it is a common practice to evaluate the level of management on the individual farm as a residual earning expressed as management earnings, operator's labor earnings, rate earned on the investment, etc. These factors are in a sense measures of management; but they are not entirely satisfactory for this purpose for perhaps three main reasons: (1) they are "after the fact" measures: they can be used only after the activity has been completed, and hence they have no prior predictive value; (2) they are not reliable as measures of management because they also reflect windfall profits and losses entirely apart from management. Likewise, they are not corrected, in the usual methods of calculation for earnings which result from varying degrees of exploitation of both human and physical resources; (3) and, finally, they measure a residual output rather than management as an input factor. It is quite conceivable that varying proportions of land, labor and capital associated with the same level of management will yield varying residual returns as measured by the factors mentioned.

So we are interested in finding a measure for the management factor per se, and such a measure as will admit, if possible, of predicting the level of management prior to the completion of the activity in question. Our problem then is a special segment of the more general problem of predicting human behavior.

Prediction research in human behavior concerns itself with two general problems: (1) finding a suitable criterion or measure of success in the activity, and (2) finding those situational and personal factors which are related to success, or are indices of factors which are related to success in the activity. Given the criterion and the predictive factors, appropriate statistical techniques can be applied to measure the degree of relationship and provide a quantitative basis for making predictions.

Predictions are usually based upon the degree of relationship between the criterion and one or more of three main types of predictive factors: (1) previous performance, (2) proficiency tests, and (3) personal characteristics. The first one requires that the individual be engaged in or have had previous experience in the activity.

Therefore it has limited value for vocational guidance to rural youths who have assumed no farm managerial responsibility. Proficiency tests measure previously acquired skills or knowledge, and therefore have limitations in the management field in addition to the difficulty of administering such tests. Personal characteristics admit a much broader interpretation of fitness for a given activity, but they present a more difficult problem of appraisal and quantification for prediction purposes. Nevertheless it is along this line that we are attempting to measure individual differences in farm managerial ability.

With these general methods and techniques in mind we are ready to approach the problem of measuring the management factor in farming, or predicting the level of success most likely to result from the personal and situational factors surrounding the individual farm operator.

One of the first problems is finding a suitable criterion of success in farming. In addition to the comments I have already made on the conventional measures of farm success, I must raise the question as to whether we can accept maximization of money income as the sole end and goal of farming. What about the non-material satisfactions in farm life, in effort directed toward the enrichment of community living, and in the use of leisure time in the pursuit of the cultural arts?

Wallace's Farmer, an Iowa farm magazine, conducted an opinion poll among Iowa farm people in the fall of 1947 on the question, "Who is a farm success?" The persons interviewed were asked this question: "Which of the following statements best describe your idea of the most successful farmer? Pick three statements marking them 1, 2, 3 in order of choice." The seven statements from which they were to choose were:

- "1. The one who gets the biggest yields per acre.
- "2. The one who follows the best soil conservation practices.
- "3. The one who is able to retire at the earliest age.
- "4. The one who gets the most income per dollar invested.
- "5. The one who has interests and satisfactions that do not depend on income.
- "6. The one who gives his children the best education.
- "7. The one who is the best leader in the community."

On the basis of first choices only, 43 percent of the men interviewed gave first choice to the best soil conservation, 16 percent to the most income per dollar invested, and 12 percent each to the big-

gest yields per acre and the non-material income and satisfactions. The women agreed with the men on soil conservation with 38 percent of their first choices, but gave second place to the non-material satisfactions with 19 percent of their first choices. The biggest yields were third with 15 percent and the highest return per dollar invested fourth with 13 percent.

These were the results as published in *Wallace's Farmer*, November 1, 1947. However, using a weighted average (weights of 3, 2 and 1 for first, second and third choices respectively) for the men interviewees reduces soil conservation to 30 percent (still first place), raises most income per dollar to 18 percent (still second place), raises non-material satisfactions to undisputed third place, educating children to fourth place, and drops biggest yields to fifth place.

I quote this survey because the results are interesting, and because it illustrates some faults in a technique that has been used in studies on the management factor at Illinois and in other states. Aside from the statistical techniques employed in making the summary of such a survey, it must be recognized that the interpretation of the results must definitely be limited to the choices made available. For example, Iowa farmers may have felt that the one who has the best kept buildings and the neatest farmstead is the most successful, or the one who owns the most land, or farms the largest number of acres, or grows the tallest corn; but they had no opportunity to say so in this survey.

Furthermore, the degree of intercorrelation between items in the schedule gives rise to interpretations in the minds of the persons interviewed that cannot be treated statistically in the type of answers given. For example, some of these Iowa farmers actually made the statement that soil conservation was necessary to achieve and insure the goal of highest income, and hence they gave it first choice over income because they felt that the income would be a natural consequence.

Enough for the present on selecting a criterion of success. In our future work at Illinois it is my hope that we can introduce sufficient refinements into the measures calculated from our farm records that we may have a suitable criterion of the *financial* value of the varying inputs of management as distinct and separate from non-material satisfactions.

I have already implied that our present approach to the problem of measuring management lies in the use of personal characteristics

as predictive factors. The entire approach, at present, is an adaptation of the forced-choice rating technique developed and adopted by the U.S. Army in 1947 for its officer ratings. The technique was suggested to us by our cooperating psychologist, Dr. L. L. McQuitty, University of Illinois Department of Psychology, who commanded the army research section that worked on its development.

The new army rating is very clearly described by Dr. E. Donald Sisson, Assistant Chief of the Personnel Research Section of the Adjutant General's Office, in an article, "Forced Choice—The New Army Rating," appearing in the autumn 1948 issue of *Personnel Psychology*. Since I cannot improve by editing what he has written I shall quote directly and at some length from his article. For purposes of the present discussion I am substituting the word "farmer" for the word "officer" in Dr. Sisson's paper.

"Forced-choice rating elements are sets of four phrases or adjectives pertaining to job proficiency or personal qualifications. The rater indicates which of the four is most characteristic of the ratee, and which is least characteristic; and repeats this selection for each of the sets included. A sample set is the following:

- A. Commands respect by his actions.
- B. Coolheaded.
- C. Indifferent.
- D. Overbearing.

It is at once obvious that two of these are relatively favorable terms, and the other two relatively unfavorable. One of the two favorable terms, checked as most characteristic, gives plus credit; selecting the other gives no credit. In the same way, picking one of the two unfavorable items as least characteristic adds credit whereas the other adds nothing.

"The construction of these tetrads and the determination of the scoring key are the crucial problems in the development of a rating scale of this type. Rundquist outlined six steps in the process.

- "1. Collection of brief essay descriptions of successful and unsuccessful (farmers) officers.
- "2. Preparation of a complete list of descriptive phrases or adjectives culled from these essays, and the administration of this list to a representative group of (farmers) officers.
- "3. Determination of two indices for each descriptive phrase or adjective—a preference index and a discrimination index.
- "4. Selecting pairs of phrases or adjectives such that they appear of

equal value to the rater (preference index) but differ in their significance for success as an (farmer) officer (discrimination index).

- "5. Assembling of pairs so selected into tetrads.
- "6. Item selection against an external criterion and cross validation of the selected items."

In our current work at Illinois we have completed step No. 1 by securing essay descriptions on 360 good farmers and a like number of poor farmers. We have about completed the list of descriptive phrases mentioned in step No. 2, and are preparing to administer this list to a group of farmers this fall.

Turning again to Dr. Sisson's article I want to quote from his technical discussion on the construction of the forced-choice tetrads.

"As already noted, the scaling and selection of the rating elements to compose the forced-choice tetrads is the nub of the problem. The basic assumptions underlying the method can be stated as follows:

- "1. Any real differences which exist between (farmers) officers in competence or efficiency can be described in terms of objective, observable items of behavior.
- "2. These 'behavior items' differ in the extent to which people in general tend to use them in describing other people, i.e., in general favorableness and this tendency can be determined statistically.
- "3. These items also differ in the extent to which they characterize (farmers) officers at one extreme of the true scale of competence as opposed to (farmers) officers at the other extreme. The index of this difference, the 'discriminative' value, can also be determined statistically.
- "4. Pairs of items can be selected such that they are equal in preference value but different in discriminative value. A rater forced to say which item is most (or least) characteristic of a ratee is thus unable to select solely on the basis of prejudice for or against him (since the preference values are equal). The rater is compelled to consider both alternatives and—theoretically at least—to do a more objective job of reporting."

With these assumptions and the outline of the steps in mind, our first task was to develop a questionnaire that would yield the descriptions we needed and such additional data as we thought necessary. Since it was impossible to assemble in one place a large enough group of farm people willing to cooperate on this study, it became necessary for the questionnaire to carry complete instructions so that data gathered from several different groups would be comparable.

Our language had to be carefully chosen to convey the intended meaning—the same meaning to all—and avoid being suggestive in any way. The opening statements were intended to stimulate interest and provide some incentive for active cooperation. Then followed a few statements asking for careful and independent work. Participants were assured of complete anonymity to remove any reticence at full and free expression. The papers were not signed or identified by the participants.

The task was divided into twelve steps to be taken one at a time and completed in order. The first step asked our participants merely to "consider some Illinois farm operators who do a poorer-than-average job of farming." One-half of the questionnaires, in alternate fashion, began with the poorer-than-average farmers while the other half began with the better-than-average farmers. Thus we secured about one-half of our descriptions on each kind of farmer before our participants began to show noticeable fatigue. It was a wise precaution since the questionnaires took from 45 minutes to an hour to complete.

The second step asked the participant to "think of three of these farm operators (better or poorer-than-average) whom you know well enough to describe most completely and accurately." Here the emphasis was placed upon how well our cooperators were acquainted with the people they were to describe. This step avoided the selection of those few individuals in every community who have earned reputations as good or poor farmers, but who are not well enough known by most people to get an accurate description. They were asked not to select relatives in order to avoid personal bias.

In the third step the participant was asked to "*pick the one from these three* who, in your opinion, does the poorest (or the best) job of farming." This step was included to give us the desired range in performance from good to poor among farmers well known to the same person. This step also avoided setting up any criterion by deliberately urging the describer to "use your own ideas of poorest and poorer-than-average" (or best and better-than-average).

The fourth step asked for a series of objective data on the farmer selected in step No. 3. Included in this list were age, years in school, total land farmed, acres of this land owned, type of farming, character of the land, and the county in which the farm was located. If the describers raised questions about their ability to answer these questions they were advised to go back to step No. 3 and select a man with whom they were better acquainted.

The fifth step was really the crucial step. Here it was necessary to convey the idea of a complete description without being suggestive or introducing bias in any way. Remember that our participants were completely ignorant of the objective of the study or the purpose for which this information was being gathered. We had to avoid using such words as "behavior" and "personality" because they are not in familiar usage by farmers and would not be interpreted alike by all. So we agreed on the following simple but straightforward statements: "We want you to write a description of *this man*. Tell us everything you know about him as a *man* and as a *farmer*. Please take your time and think. He may have both good and bad characteristics; describe them both. The important thing is that you describe him as completely and accurately as possible."

Steps 6 through 10 were an exact repetition of steps 1 through 5 except that where one called for a poorer-than-average farmer, the other called for a better-than-average farmer. Steps 11 and 12 were opportunities to enlarge upon the first descriptions through the aid of a list of items intended to remind them of statements which they failed to make in their original descriptions. These reminders were not handed out until the original descriptions had been handed in.

Of the 360 questionnaires filled out 18 were written by high school vocational agriculture teachers, 44 by Soil Conservation Service Work-Unit Conservationists, 13 by fieldmen in the Farm Bureau Farm Management Service, 43 by professional farm managers, 81 by freshmen and sophomore students in the College of Agriculture, and 161 by farmers cooperating in the Farm Bureau Farm Management Service. Thus all of the descriptions were obtained from people living on farms or working more or less intimately with farmers.

Whatever doubts I may have had about the ability of our farmers to become articulate with a pencil certainly disappeared when I read their essay descriptions. Among some of the rather original and poetic expressions they used in describing the poor farmers were these:

- "Always fixing when he should be farming."
- "More or less works around the edge of a job."
- "A non-farm-management farmer."
- "Hurries everything he does but getting home from town."

And the one that has particularly impressed me with its literary

style and its aptness: "Neither whiskers, nor weeds, nor uncastrated pigs annoy him."

The 360 questionnaires, or 720 descriptions of individual farmers yielded approximately 7,500 descriptive statements, phrases or adjectives. Each of these was put on an individual punch card together with all the data associated with it such as the age of the farmer to which it applied, his education, size of farm, tenure, type-of-farming, etc. Thus we have an enormous amount of data for analysis pertinent to the present problem.

Our first job was to classify each of 7,500 descriptive items and make a list of one representative item for each classification. Since this step involves a good deal of subjective judgment we decided that the job was to be done independently by three different people with a final meeting to reconcile the differences. Dr. McQuitty and I have completed our classification at this writing, and Dr. D. M. Hall, Extension Service, University of Illinois, is working on the cards at the present time. In my own classification I recognized some 328 different items applying either to job proficiency or personal characteristics.

The embodiment in one individual of functions comparable to business manager, foreman, and laborer produces a complex problem which is further complicated by the self-employed, rather independent situation of the average farmer. I anticipate that we shall encounter difficulties in scaling which may result from the fact that the population of farmers includes a wide range of personalities and attitude types that may produce a mixture of scale values for similar character traits or descriptive items. There is a possibility of a number of rather independent types among the poor farmers which may require a considerable degree of stratification on both personal and situational factors to get satisfactory scale values.

The tenure situation will require special treatment to correct for the influence of the landlord who may contribute a great deal to the apparent success of a tenant farmer, or who may actually prevent the tenant from using his best managerial ability. Still other problems confront us, such as obvious inequalities of opportunity and the matter of being "born at the wrong time", that greatly influence the degree of success in an economic venture over and above the entrepreneur's personal contribution. At this writing we have no final answers. We do have hope, the will to work, and some interesting hypotheses.

MULTIVARIATE ANALYSIS OF FARM AND RANCH MANAGEMENT DATA

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IN GETTING at this subject, perhaps I should define what I think was meant by "multivariate relationships." This might be described as a relationship wherein the behavior of one characteristic or variable (the dependent variable) is influenced by the behavior of two or more characteristics or variables (the independent variables). The problem of multivariate analysis is generally accepted as being that of identifying, isolating, and measuring the influence that each independent factor exerts on the dependent factor.

There are several conditions generally inherent in farm and ranch management data that tend to make this problem very complex. In the first place, there usually are many independent factors to be identified; secondly, in nearly all cases the influence is not linear, but responds to the law of diminishing returns within the range of a given study; third, most of the distributions are not normal but are skewed to the right. (There are several methods available for converting a skewed distribution into a normal one—but they are rather complicated and require a great deal of time.) The relationships are not additive, but are joint—that is—the influence of one independent factor on the dependent factor is not determined entirely by the size of that one independent factor alone, but is influenced by the size of another independent factor. There is also a problem of causal relationships—when a change in the magnitude of one independent variable is the direct result of a change in the magnitude of another independent variable.

My procedure, in starting on this assignment, was to review the vast amount of literature on the subject. This problem certainly is not new. The next step was to compare these several methods through the details of analysis of a given set of farm management data. Some sixty farm records taken in 1947 were used in comparing these methods. Determining the factors affecting profits was selected as the problem, as it is one that has long since been explored by Dr. Warren and others, and whose conclusions have been proven time and time again. I have selected this problem because it adapts itself so well to multivariate analysis.

It will be impossible in this brief discussion to outline the methods, or to substantiate conclusions with a detail of figures. I will merely discuss the relative merits and weaknesses of the several methods available for making a multivariate analysis of farm management data as I found them to be.

Tabular Analysis, or cross tabulation, is the simplest method available, as it is based solely upon the arithmetic average. From the standpoint of time and clerical help it is the most efficient. As the data in each subgroup are used in determining the averages of that subgroup only, and exert no influence beyond that subgroup, this method makes most inefficient use of data. For example, if there are four independent variables to be studied, and if the data are broken into three groups for each variable, it would necessitate 972 farm records to give 12 observations for each subgroup if the farms were all equally divided among the subgroups, which, as you know, would seldom happen. For most of us, this number is prohibitive.

The method offers no measurement as to how closely the factors being studied are correlated. The reliability of tabular analysis may be tested by the "t" ratio test and the analysis of variance technique for significant differences between the subgroup averages.

One of the errors of tabular analysis of multivariate relationships arose from the erroneous assumption that to subdivide farms on the basis of magnitude of size, and yield, eliminated, in turn, the effect of the one factor on the other. This was not true. There was considerably greater variation in size of farms on those whose yields were below average than on those whose yields were above average. Neither was the crop index the same for the different sized groups. This is an interserial influence that tabular analysis fails to consider. Aside from this interserial or causal influence, joint relationships can be isolated using tabular analysis. Because of its inefficient use of data, the nature of the curvilinearity of a relationship cannot be accurately determined, because the data cannot be broken into a sufficiently large number of subgroups to establish curvilinearity.

Mathematical Correlation is the technique of describing a line that most nearly fits the data being studied. The most universally used mathematical device for fitting a line is the method of least squares, which describes a line from which the deviations, when squared, will be smaller than any other line. The advantages of mathematical correlation are: (1) it makes more efficient use of

data than the other methods, (2) it measures the degree of correlation between the factors being studied, and (3) measures of reliability, and the standard error of estimate, can be computed from the calculations required for the regression equation.

The disadvantages of the method are: (1) it is difficult and tedious to work. For example, with just four independent factors, two pairs of which are joint, assuming the simplest form of curvilinearity, it would take 66 different series of computations as the basic data from which the normal equations could be solved; (2) the biggest weakness of this method is that the selection of the formula determines the general nature of the line—i.e., a linear equation is capable of describing only a straight line, even though the relationship may actually be curvilinear. There are many curvilinear formulas possible, from which the analyst must choose one that will best describe the relationship to be studied. Thus he pre-determines his answer a great deal by his selection of a formula. With a joint relationship this procedure is complicated further by the number of possible ways of describing the joint relationship. It may be expressed as $X_1 = b_2X_2 + b_3X_3 + b_{23}X_2X_3$, which is perhaps the simplest expression. The relationship might also be

$$\frac{X_2}{X_3}, \quad \frac{X_2}{\log X_3}, \quad \frac{X_2}{\log X_3}, \quad \frac{1}{X_2X_3}, \quad \frac{X_2 + X_3}{\log X_2X_3}$$

and many other more complicated forms.

Before leaving the mathematical correlation methods, mention should be made of the *Court* method for analyzing joint relationships, published in 1930. This method depends upon a mathematical rotation of the surface of cubes so that instead of averaging the values only when viewed with respect to the rectangular axes, they may also be averaged with respect to axes cutting across the surface at an angle. This method is worthy of investigation and study by the farm management analyst.

Graphic Correlation analysis is of several types. There is what I will call the formal method, which has as its starting point the mathematical linear multiple correlation, and makes a series of corrections to these lines by plotting the residuals or deviations until no further corrections appear warranted. Another method, the short-cut or *Bean* method, was developed by Louis Bean. This method assumes the general nature of the relationship by plotting a few selected observations, and then makes a series of corrections

on the assumption by plotting the residuals. This method took less than one-fourth the time required for the formal method.

These two graphic methods have much the same advantage as the mathematical correlation. They are less precise, however, and must be used with caution. If the number of cases are extremely large, they tend to lose some of their advantage of saving time and clerical labor. They do have an advantage in that they do not assume to know the nature of the relationship at the outset.

Determining joint relationship by contours. A method has been worked out by Frederick V. Waugh and others by which a three-variable surface may be smoothed directly in both independent dimensions at one time by the use of isorropic lines. With this method the nature of the relationship is not assumed at the outset, but unfolds as the work progresses. The first step is to plot the observations on a graph, with one independent variable as the abscissa, and the other independent variable as the ordinate. Thus, the location of each observation on the chart is determined solely by the size of these two independent variables. The value of the dependent variable is written on the graph beside the point where the observation falls. The joint relationship becomes evident upon inspection by comparing the location of the points whose values are approximately equal. To assist in the measurement of this joint relationship, contour lines are drawn in by inspection to most nearly represent the scale of values for the dependent value. This, of course, can be only an approximation. The deviations of the actual from the estimated, can be obtained by interpolation. It is obvious that the standard error of estimate, and the index of correlation can be only an approximation.

This method does have merit in that it is highly flexible, and saves time. It is limited to two independent variables at one time, however.

The problem of causal relationships between the independent variables. When a change in the magnitude of one independent variable is the direct result of a change in the magnitude of another independent variable, they are said to have a causal relationship. If one of the two causal factors is held constant at its average while the other factor is varied, a condition has been created mathematically which will not be likely to happen in actual practice. For example, it was desired to determine the net effect on income of feeding livestock, after the effects of size, crop yields, and labor

efficiency were eliminated by being held constant. Two arguments for feeding livestock are that it will increase crop yields and labor efficiency. Thus, to hold these two factors constant at their average while studying the effects of feeding livestock, eliminates some of the advantages of feeding livestock. It is impossible to isolate the net effect of livestock feeding on income by any of the methods mentioned thus far. However, the mathematical regression equation, *when taken as a whole*, and the multiple correlation coefficient, give the correct combined effect of the several factors studied.

With tabular analysis, a causal relationship introduced an error that was not detected when only the average labor income for each group was presented. The error was due to variation in the average values of the independent variable, when the assumption was made that they were the same. Thus, the influence of a factor was not eliminated by subgrouping, because of an interserial or causal relationship, which also contributed to unequal numbered subgroups.

In summing up my investigation of the question of causal relationships between independent variables, it must be pointed out that when a causal relationship exists between two independent factors, the net effect of one of the independent factors on the dependent factor cannot be determined. The true combined effect can be determined using multiple joint correlation, provided the correct mathematical formula is selected.

It might be well to review the *purpose* of our investigation in farm management. If the purpose is to determine the most favorable combination of highly inter-related factors, should we concern ourselves with trying to isolate and measure net effects of each factor? From the multiple joint correlation regression equation the most favorable combination of factors can be arrived at mathematically by use of the integral and differential calculus.

As might be expected, there is no one solution to the problem of which statistical method to select for multivariate analysis of farm management data. Quantity of data is one of the determining factors considered in the selection of the method to be used. Because of the paucity of data available in most farm management research, cross tabulation is of doubtful reliability for the final analysis. Mathematical correlation is too inflexible for use in the original investigation procedure. Tabular analysis, and the graphic methods should be used to explore the many possible related factors

in any management study. Those factors that appear to exert the greatest influence can be defined further and tested by the mathematical correlation methods and calculus.

My very limited investigation leads me to say that our science does not stand in need of statisticians, as such. What it really needs is farm management analysts, equipped with economic theory as a tool, and trained also in statistics. Edgar Allen Poe stated this more keenly: "To observe attentively is to remember distinctly; . . . While the rules of Hoyle (themselves based upon the mere mechanism of the game) are sufficiently and generally comprehensible. Thus to have a retentive memory, and to proceed by 'the book,' are points commonly regarded as the sum total of good playing. But it is in matters beyond the limits of mere rule that the skill of the analyst is evinced. He makes, in silence, a host of observations and inferences. . . . The necessary knowledge is that of *what to observe.*"¹

DISCUSSION

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These three excellent papers discuss several new approaches and techniques in farm management research. Mr. Fellows' paper on developing and applying production functions in farm management research places this technique in proper perspective. All of us are interested in increasing our knowledge of how to establish relationships between variables so prediction can be made with greater certainty. The use of mathematically derived production functions will be extremely helpful, but as Fellows points out we do not have the data available in many areas, particularly in physical input-output relationships, to derive the kind of production function that would be most useful.

Fellows rightly points out some of the weaknesses of institutional segmentation of research. This is an old problem, but progress is being made. A particularly hopeful sign is the great interest in developing balanced farming and similar programs. These programs emphasize the farm management approach—the necessity of treating the farm as a unit and obtaining coordination and integration—not only in the farm plan and operations, but also among the various specialists giving advice to farmers. These developments, however, will challenge farm management workers still further to supply the necessary economic evaluation and interpretation.

The development of standard performance rates seems to be a very useful device. Farm management workers can be in the vanguard in pointing

¹ Edgar Allan Poe, "The Murders in the Rue Morgue," *Representative Selections* by Alterton and Craig, American Book Company, New York, 1935.

out to farmers the possibilities in adoption of new technologies—rather than reporting what has happened after their adoption generally by farmers.

Mr. Reiss' paper deals with an intriguing, although difficult subject of research. It is indeed gratifying to have some one tackling this difficult problem with some new and fresh ideas. The Division of Farm Management and Costs is much interested in this work, in fact to the extent of helping initiate and finance the project.

We have felt that in order to make progress beyond that attained heretofore and to take advantage of some wartime developments, a marriage was necessary between farm management and psychology. This is essentially an experimental study. Whether it is possible to identify personal characteristics in farmers or prospective farmers that will have predictive value in measuring success or managerial ability in farming is certainly open to question. But here is a new approach that offers some possibilities.

Hopkin has given an interesting appraisal of the merits and weaknesses of available methods of making multivariate analysis of farm management data. Occasionally we need to take stock of our bundle of tools and reappraise their usefulness, if for nothing more than to refresh our memories a bit. We need to give careful thought to which statistical technique is best under particular circumstances and objectives. Too many of us give too little thought in planning of projects to the most appropriate kind of statistical analysis.

Emphasis on development of hypotheses and careful attention to project design, including the development of the most appropriate statistical technique for the particular objectives—all this prior to the taking of field schedules—is certainly an essential if we are to make most effective use of limited research budgets and make the progress in research results that is expected of us.

We can go in several directions in planning our research. First, with relatively fixed budgets we can limit the number of studies made so that each will include enough cases for valid statistical treatment.

Or second, we can quit trying to make all-purpose general farm management surveys that try to cover all conceivable situations in a farming area. This means limiting the scope of studies to a few of the more important situations or variables. For instance, we can limit our sample to 80-acre dairy farms of a particular soil type, rather than attempting to cover several different sizes and soil types.

Or third, we can give more emphasis to case analysis. This has some weaknesses for some purposes, but may have far more value in the end than attempting broad-scale statistical analysis with inadequate data.

I believe we have made some progress in use of better statistical and research techniques in recent years, particularly in the direction of more precise delineation of the problems to be studied, in more careful determination and limitation of the universe to be covered in terms of the important variables, and in more careful sample design and sample selection.

These are problems, however, that need careful consideration in all of our research, and I'm sure that much more progress is possible than has been attained so far.

NEEDED NEW DIRECTIONS IN AGRICULTURAL PRICE ANALYSIS

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THIS paper is addressed to persons who, like myself, are primarily interested in answering specific questions about agricultural prices. I should like to separate the applied science of agricultural price analysis rather sharply from the related pure sciences of economic and statistical theory. When I speak of needed new directions I am thinking of ways in which the level of applied work may be improved and the results made more useful for purposes of prediction or policy formation.

Regardless of the state of pure theory, decisions must be made and action taken. Price support legislation, storage policy, marketing agreements and cooperative marketing programs all raise questions which involve supply and demand curves. In the absence of measurement, such questions may be answered only by hunch and assertion. Arguments over the merits of flexible price supports are partly based upon different assumptions regarding farmers' response to price. The relative merits of price support purchases and compensatory payments for different commodities depend partly upon the shapes of their demand curves. The desirability of using compensatory payments on hogs depends partly upon the closeness of competition between hogs and beef cattle. Wherever measurement of the key relationships is possible, there is a chance to improve the quality of administrative or legislative decisions.

The usefulness of such measurements will depend very largely upon the adequacy of the economic and institutional analysis underlying them and upon the appropriateness of the statistical techniques used. However, I feel very strongly that improvement in the present level of applied work does not need to wait upon *new* developments in theory or methodology. I think we can still make some advances in agricultural price-supply-demand analysis with no more elaborate theoretical tools than were available to Ezekiel, Schultz, and others almost twenty years ago. Additional insight can be obtained with the aid of economic and statistical concepts developed or popularized during the last two decades.

Successful price analysis requires a fusion of statistical technique, economic theory and specific knowledge of commodities and

markets. This is a big order for one person. Few commodity specialists have made the necessary investment in theory and technique. On the other hand, a predilection for theory is often associated with a distaste for empirical research. The striking thing about the development of price analysis in the 1920's is that it was spearheaded by men who were primarily agricultural economists, and who reached out into economic and statistical theory for the purpose of improving their applied work. However, this tradition has been greatly attenuated by sixteen years of farm programs, war and reconversion during which these men and their immediate followers moved out of price analysis or at least into positions where they had little time or incentive to publish in that field. On the basis of published work, it would be hard to identify any successors of Ezekiel, Bean, Waite, and Working who have achieved a more effective synthesis than they did of the skills and interests needed for commodity price analysis.

In my opinion, the most immediate need of agricultural price analysis is that young men with advanced training in theory and statistics be brought into contact with the practical problems of the field. In view of the increasing specialization of economic theorists, mathematical statisticians and commodity analysts, it may actually require teams of specialists under competent and imaginative supervision to fill this need.

Given the basic combination of skills and interests, there are good reasons for believing that we can improve upon the analyses of the late 1920's and early 1930's. (1) In the first place, we have longer statistical series. Whereas many of the price analyses made in the 1920's were based on pre-1914 data, we now have for most commodities about 20 years of usable data from the interwar period—roughly, 1921 to 1941. (2) Improvements have been made in our basic estimates of production, prices, and stocks, and new series on total and per capita consumption have been developed. Thus, more economic concepts now have their statistical counterparts, and errors of measurement in many of the basic series have been reduced. (3) In particular, we now have estimates of national income and related variables which are much better measures of demand for farm products than the makeshifts (such as industrial production, pig iron production or stock prices) which were sometimes used in the early 1920's.

In using these improved materials, we can avoid one of the dead

ends encountered in the early and middle 1920's, the correlation of only distantly related variables with the immediate object of obtaining a high correlation coefficient. As a rule, relationships of this sort proved highly unstable. The mere fact that such analyses did not "make sense" in terms of economic theory tended to reflect discredit upon the whole field of quantitative price research.

Really fruitful lines of development must be based upon concepts of causation or at least structural relationship. This view was strongly advocated by Sewall Wright and E. J. Working in the 1920's and early 1930's. It lies at the basis of Ragnar Frisch's method of confluence analysis and of the Cowles Commission technique. In 1934, E. J. Working stressed "the need for analysis of demand in terms of causation . . . It is only when we combine statistical evidence in a closely knit reasoning process that we can hope to arrive at causal and hence permanent relationships between factors." This passage was quoted with approval by Tjalling Koopmans in 1937. Subsequently, Mr. Koopmans has played an active part in developing the Cowles Commission technique, which aims at the measurement of structural relationships between economic variables.

The philosophically minded may boggle at such words as causation. If our economy were really a static universe, we might satisfy ourselves with statements about the probability that a given value of pig iron production would be associated with a Chicago corn price lying within a specified interval. In actuality, the danger of spurious correlation between time series due to trends and major cycles is so great that we can hardly hope to obtain stable relationships unless we succeed in approximating rather simple and direct lines of influence which reflect the behavior of identifiable economic agents.

This approach places a great deal of emphasis upon the preliminary analysis of a problem. On a formal level it may involve the construction and simultaneous statistical fitting of complete "models." A less ambitious but highly instructive procedure is simply to draw a diagram of the various factors which seem, on the basis of observation and theory, to be involved in the problem. Starting with a central square representing (say) the U. S. average farm price of a commodity, bring in the various elements which play upon it most directly, such as farm production and stocks and dealer and processor demand. The demand of processors, for ex-

ample, is influenced by anticipations of demand from wholesalers, retailers and ultimately from final consumers. The quantity demanded by consumers is influenced by the retail price of the given commodity and to a lesser extent by those of competing commodities; also, by consumer income and other factors. As a matter of logic, such a diagram can be elaborated into a complete system of Walrasian (or Hicksian) equations. But this is merely the *reductio ad absurdum* of a useful tool.

Such a diagram, extended to not more than twenty or thirty "boxes" or variables, will lead to the conscious consideration of a good many problems which might otherwise be glossed over. What minimum time unit is necessary, in the case of a particular commodity, to average out the effect of anticipations upon the relationship between farm and retail prices? What is the maximum time interval within which current production or supply is not significantly affected by current price? Is it permissible to express farm price directly as a function of consumer income, or is it necessary to measure separately the relation of retail price to consumer income and the relation of farm price to retail price? Is it reasonable to use the index of wholesale prices of all commodities as a deflator or demand shifter in explaining the farm price of potatoes? A diagram may indicate that various components of this index enter into the explanation in such different ways that no confidence can be placed in the net regression of potato prices upon the over-all index. It may also lead to a realistic appraisal of the degree of error introduced by aggregating or ignoring certain variables, and by measuring certain coefficients or characteristics of a model independently of others.

I do not think that successful application of a causal or structural approach requires the simultaneous determination of every net relationship in such a diagram. The Cowles Commission has, indeed, worked out a technique whereby a complete model, defined in terms of five or more equations and fifteen or more "structural coefficients," can be fitted simultaneously. However, as the complexity of such models increases so does the likelihood of introducing some weak or unstable elements into the structure. Each structural coefficient represents an average relationship over the whole time period for which the model is fitted. Unless the underlying relationship has in fact been fairly stable over this period, that particular coefficient will be misleading and it may also lead

to distorted values for the other coefficients. A model which assumes the stability of each of a large number of net relationships over a twenty-year period may well imply a greater degree of economic determinacy than has actually existed. The Cowles Commission has opened up what may prove to be a very fruitful type of analysis. Its discussions of the "identification problem" and the biases which arise when the least squares method is used inappropriately have been useful byproducts. However, the published applications of the Cowles Commission technique to date have been mainly illustrative, and considerable further testing and development is needed before its place in substantive research can be defined. In the meantime, the pursuit of structural or causal relationships must be carried on largely by other means.

One line of attack is the cross-checking and comparison of logically related analyses. Most commodity price analysts in the past have looked at one product at a time. Yet it seems quite obvious that an analysis of the demand for all meat should be checked against similar analyses for beef, pork, lamb, and veal, taken separately. Analyses of retail meat prices should be checked against analyses of farm prices or Chicago prices of meat animals. Analyses of farm prices and farm cash receipts from meat animals should check out against analyses of cash receipts from all livestock products as a group. An estimated elasticity of demand for all food at retail may have to be reconciled with the estimated flexibility of U. S. farm prices with respect to the physical volume of farm marketings. Time series results should make sense in relation to family budget data or the results of consumer preference studies.

In a word, I believe that our knowledge, or hypotheses, about factors affecting farm prices will have to be based primarily upon the agreement or disagreement of many semi-independent pieces of evidence. I do not know what sort of probability statements we shall be able to make as the result of our cross-checks and comparisons. It may be useful in some cases to combine a number of separate equations into a more complicated model which can be fitted by the Cowles Commission technique. In other cases it may be legitimate to pool information from two or more equations by other mathematical processes. However, in the present state of the art, we cannot avoid nonstatistical judgments when we try to allow for recent changes in the structure of forces playing upon a

commodity. Only Laplace's "divine mathematician" could hope to fit all elements of the agricultural price system into an unambiguous set of prediction equations.

So far in this paper I have tried to make the following points: (1) We need to establish, either in individuals or in teams of specialists, the sort of combination of theoretical and factual knowledge to which the leading analysts of the 1920's at least aspired; (2) we should concentrate on a search for causal or structural relationships which "make sense" in terms of economic theory and institutional factors and which are therefore likely to be fairly stable over the time interval with which are we concerned; (3) the search for structural relationships can be aided by careful qualitative analysis of the lines and directions of relationship between variables, and perhaps by the construction of mathematical models; (4) aside from careful qualitative analysis, our main safeguard against false conclusions from individual price analyses will lie in the reconciliation of semi-independent analyses for other commodities, aggregates, or market levels. By and large, these suggestions amount to a revival and amplification of the "traditional" approach to price analysis developed in the 1920's, with progress depending in part upon the existence of longer and better statistical series than were available at that time.

However, there have been a number of developments in economic and statistical theory during the past two decades which may further enrich our applied work. One of these is the concept of indifference curves which was reintroduced into the British and American literature by Hicks and Allen during the 1930's. Even though it may not be possible to measure indifference curves empirically, I think that the concept is helpful in visualizing the relationships between competing and independent commodities and the differing effects of changes in relative prices, in incomes, and in tastes.

Theories of imperfect competition with their emphasis on product differentiation may improve our applied work by helping us to avoid sweeping generalizations about "average prices" which are not justified by the structure of the markets in question or by the substitutability of the different grades and varieties which figure in the average. The concept of cross elasticities of demand which grows out of the theory of imperfect competition may be useful

in determining the relative homogeneity of commodity groups and the permissibility of aggregating the prices or quantities of different commodities into a single composite variable.

In the field of statistical technique, Ragnar Frisch's method of confluence analysis, developed during the 1930's, should be singled out for experimentation and testing in applied work. Efficient application of Frisch's technique requires that regression coefficients be calculated by a matrix method with which few agricultural economists in this country are familiar, even though an appropriate computation scheme was published by Fred Waugh more than ten years ago. Frisch's method stems from the basic fact that when two variables are not perfectly correlated, two different regression equations are obtained by minimizing the squared deviations for each variable in turn. The structural relationship (if any) between the two variables presumably lies somewhere between the two elementary regression lines. Confluence analysis provides a routinized method of determining the consistency of correlation results when deviations are minimized along different axes and also of determining the effect of additional variables upon the net regression coefficients. Frisch's method was extensively used by Tinbergen in the statistical testing of business cycle theories (1939), and has more recently been used by the British economists Richard Stone (1945) and A. R. Prest (1949) in the field of price and consumption analysis. It is possible that the mechanical safeguards offered by this method will cause some investigators to slight the basic qualitative analysis of their problems. Nevertheless, it is a tool which deserves serious trial in this country.

One area in which radically new methods may be needed is the analysis of short-run changes in prices of perishable commodities. This area is of particular concern in the operation of marketing agreements which provide for volume and quality controls. For example, the level and slope of the demand curve in Week Number 4 may depend upon the volume and quality of shipments in Weeks 1, 2, and 3. Due to inertia if nothing else, the position of the demand curve in Weeks 5 and 6 might be affected by the position in Week 4. Thus the problem of maximizing returns over the marketing season as a whole involves the controlled distribution of the commodity between *interdependent* markets.¹

¹ This problem was brought to my attention by George Mehren of the University of California.

Care must be taken here to distinguish between shifts in the demand curves of final consumers and shifts in the demand curves of dealers based on short-run anticipations. It seems likely that anticipations will play a prominent part in farm price changes during any period which is short in relation to the normal transit-and-storage life of the commodity. The traditional methods of season-average-price analysis are probably inadequate to explain such short-term price variations. Special case studies may be necessary to disclose the rational and irrational factors that enter into the anticipations of representative dealers. Study of highly perishable commodities may also throw light on the more general problem of determining the minimum interval of time which is logically and/or statistically necessary to reduce the interdependence of successive price observations below some predetermined level.

Time does not permit the consideration of several technical problems on which new research is needed, such as aggregation, statistical deflation, and choice of functional forms. Among other things, the choice of appropriate variables to represent consumer demand has not yet been definitively treated. I should like, however, to raise one extremely practical question which faces us at the present time: How shall we adapt analyses for the interwar period 1920-41 to the requirements of prediction and control during the years immediately ahead? The trebling of national income and near doubling of the wholesale price level since the 1930's have raised the problem of extrapolation in an acute form. The requirements of extrapolation may force us to use logarithmic rather than arithmetic equations for the interwar period in many cases, and in others to use deflated rather than actual prices. Analyses based upon year-to-year changes (for example, logarithms of link relatives) may be more useful in many cases than extrapolating analyses based upon the original variables. The recent studies of Cochrane and Orcutt indicate that the first step, and in many cases the only necessary adjustment, in analyzing relationships among serially correlated time series is to transform each series to first differences. Of course, the year-to-year change method breaks down when demand shifts rapidly, as it apparently did in the case of meat and dairy products during 1948-49.

One other possibility is that the methods of sequential analysis can be adapted to choosing between alternative models in a minimum amount of time. Certainly, each new year of the postwar period furnishes us with additional information on the structure of

postwar demand. I am hopeful that we can obtain much more accurate forecasts by the pooling of prewar and postwar information than would be implied by the standard errors of forecasts from the prewar analyses themselves. It should give us some encouragement to consider that a similar problem of extrapolation also existed in the 1920's, a period during which great progress was made in price analysis.

STATISTICAL ISSUES IN PRICE RESEARCH

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AS MR. FOX has suggested, there is great diversity among the procedures currently used or advocated in the analysis of demand. The diversity exists even though all the workers may concur in thinking of the nature of our economic system on the lines of the Walrasian model, consisting of a very large number of simultaneous equations connecting all economic variables.

The diversity of procedures appears as soon as the workers try to use their common model for prediction. Unfortunately, the model is only vaguely specified, and is extremely complex. Anyone who wants to use it in clarifying social problems must accept the necessity for simplification. Wherever there is simplification, there are sources of error in prediction. Each worker will choose his own simplification, attempting to avoid the errors that he thinks can be easily avoided, and those that he thinks have serious effects on the appropriateness of social action.

Under such conditions, it is not to be expected that there will be any one procedure that ought to be considered the correct one. At least for the present, there seems to be little hope of avoiding a resort to opinion. As price research continues, there may be a consensus among workers to the effect that a certain type of error can be handled conveniently by adopting a specified technique; in such a case, the refinement can be expected to become part of the working knowledge of most researchers. In another case, there may be no feasible way of determining the relative seriousness of a group of errors; in such a case, workers may have to rely on intuition, or on a comparison of computation difficulties.

The uncertainty that surrounds our work can be seen by considering the relation between "shock" and "error" models. Assume that one of the equations of a complete economic model is the following:

$$(1) \quad \alpha p + \beta q + \gamma I + \epsilon_1 x_1 + \cdots + \epsilon_n x_n = 0,$$

where

p is the price of a good,

q is the quantity bought in a specified period,

I is the national income for the specified period,
 $x_1 \dots x_n$ are other variables influencing the relation between
 price and quantity, and
 $\alpha, \beta, \gamma, \epsilon_1 \dots \epsilon_n$ are unknown parameters.

The variables $x_1 \dots x_n$ have, individually, slight effects on price and quantity. However, taken as a group they exert a significant influence on the market results.

Assume that we are unable to observe $x_1 \dots x_n$. Assume also that we are unable to observe I directly; instead, we observe an I^* ... a composite of I and other variables, $y_1 \dots y_m$. Concretely, let

$$(2) \quad I^* = I + \eta_1 y_1 + \dots + \eta_m y_m$$

where $\eta_1 \dots \eta_m$ are unknown constants.

Suppose that we fit some function to the variables p, q, I^* . We shall have

$$(3) \quad \alpha^* p + \beta^* q + \gamma^* I^* = 0$$

where $\alpha^*, \beta^*, \gamma^*$ are the fitted constants. This expression is equivalent to

$$(4) \quad \alpha^* p + \beta^* q + \gamma^*(I + \eta_1 y_1 + \dots + \eta_m y_m) = 0.$$

Plainly, α, β, γ and $\alpha^*, \beta^*, \gamma^*$ are different sets of numbers. They differ because (4) includes a spurious "y" influence, and because it also excludes a legitimate "x" influence. The inclusion of the "y's" represent "error." The exclusion of the "x's" represents "shock."

Presumably we can improve on $\alpha^*, \beta^*, \gamma^*$, if we take into account both types of shortcomings in our model. However, no way of doing so is available at the present time. There are ways of dealing with either "error" or "shock" separately. In choosing to use either an error model or a shock model, the worker must make up his mind about the relative seriousness of the two differences between (1) and (4). For instance, he must decide about the seriousness of imperfect reporting of statistics (error) in relation to the seriousness of the omission of a large number of variables whose individual effects on the market are slight (shock). Presumably there is no reason why all workers should reach the same conclusion on such an issue. For instance, a large part of the research that has been done at the Institute for Applied Economics, Cambridge Uni-

versity, has assumed an error model.¹ On the other hand, most of the work identified with the Cowles Commission has assumed a shock model.²

Issues

Simultaneity: It seems to be necessary to deal with at least one demand curve and at least one supply curve, if we are interested in finding the demand curve for any product. We observe prices and corresponding quantities. Presumably every price-quantity point is the intersection between a demand curve and a supply curve. If we are to predict future intersections, we must attempt to understand the demand and supply curves.

If we wish to improve our knowledge of demand curves, it is important that we should not exaggerate the amount of information contained in just the price-quantity observations. To every price-quantity point there corresponds an infinite number of demand and supply curve combinations that could have intersected at the given point.

If we were limited to price and quantity observations, we could never "identify" a demand curve or a supply curve—we could never say about a particular equation: "There is reason for preferring this equation to every other equation, as an approximation to the unknown equation that describes demand conditions." Fortunately, we can observe other relevant statistical series. Under favorable conditions, we can construct curves having particularly strong claims as preferred approximations to demand and supply curves. In at least some problems, the limited information method, perhaps supplemented by complementary procedures, seems adequate for "identifying" demand curves.³ There is good reason to hope that some combination of current methods can provide a reasonably good analytical basis for policy decisions affecting agricultural prices and outputs.

The limited information method is called a simultaneous method, because models on which it is used include at least two equations,

¹ Richard Stone, "The Analysis of Market Demand," 108 *Journal of the Royal Statistical Society* 286, 1945; A. R. Prest, "Some Experiments in Demand Analysis," 31 *Review of Economics and Statistics* 33, February 1949.

² M. A. Girshick and Trygve Haavelmo, "Statistical Analysis of the Demand for Food: Examples of Simultaneous Estimation of Structural Equations," 15 *Econometrica* 79, April 1947.

³ T. W. Anderson and Herman Rubin, "Estimation of the Parameters of a Single Equation in a Complete System of Stochastic Equations," 20 *Annals of Mathematical Statistics* 46, March, 1949.

to be solved simultaneously for certain parameters. The number of equations must equal the number of endogenous variables. Any variable appearing in the analysis is endogenous unless it is either a disturbance (a composite of a number of variables that are not observed directly) or a predetermined variable (one that can be regarded as given for the purpose of the problem being investigated.) We shall undoubtedly treat as endogenous variables the price and quantity of the good whose demand curve we want. If any other good is particularly closely related to the given one in the minds of buyers or sellers or both, we may include equations for the demand and supply of the second good.

Clearly our decision to include or exclude a certain equation involves some judgment. If we proceeded in a certain extreme fashion, we should attempt to deal with supply and demand equations for several grades of cotton. We must expect disagreement on the feasibility of certain degrees of fineness in our distinctions among grades. On the other hand, we may agree that a model used in finding the demand for butter ought to include equations relating to oleomargarine.

Another difficult problem relates to the treatment of social aggregates, such as the national income. Suppose that national income is included in the demand equation for the commodity in which we are interested. Must we deal with an equation accounting for the determination of national income?

In the past, many workers have treated such aggregates as given functions of time, and therefore not to be determined simultaneously with the price of an individual product. On the other hand, Girshick and Haavelmo, in their distinguished study of the demand for food, deprecate such treatment: "We could always split up total consumption into small sub-groups by a sufficiently detailed specification of the various types of consumer goods. Obviously, such a regrouping could not alter the fact that changes in the total consumer expenditures have a direct effect on income, income being the sum of consumers' expenditures and investment expenditures. We must therefore assume that income . . . depends to some extent on the random shifts . . . in the demand for food."⁴

It appears unwise to make a statement as sweeping as that of Girshick and Haavelmo. We must always base our judgments partly on the nature of the specific social problem on which we are

⁴ Girshick and Haavelmo, *op. cit.*, p. 88.

working. Presumably we can agree that a complete description of the operation of our economy would include an account of each market's effect on the national income. But we cannot yet escape from the galling constraint to accept approximations in place of the truth. When we allocate the resources available for an analysis of a particular social problem, it is not obvious that we must always concentrate on getting a relatively accurate representation of the process of determining national income. The price of a group of grades of cotton may have little effect on the national income; accordingly, we may choose to focus our attention on the relations among the prices of the several grades. On the other hand, if we deal with something that we call the market for food, perhaps we must follow Girschik and Haavelmo in writing an equation describing the formation of national income.

However, there is some reason to think that our work in the near future can be most fruitful if we restrict ourselves to small groups of commodities. There is danger that in dealing with agricultural aggregates we may obscure the problems connected with the allocation of resources within agriculture. Successful treatment of broader social problems may have to wait until someone has put aggregative economics into a more satisfactory condition. Before we include aggregative equations in the determination of demand curves, we ought to ask ourselves whether, for instance, there is not considerable justification for Howard Ellis's statement about one of the aggregative relations: ". . . The consumption function seems to resemble the Holy Ghost: a derogatory attitude toward it is the ultimate sin, but precise information about it is hard to come by."⁵

Setting Up the Simultaneous Model: It is possible to start our statistical work by assuming that we know what variables belong in each of the equations that we propose to use. If we have at our disposal an economic theory that seems to have passed its critical tests well enough for our purposes, there is a fairly strong reason for using the equations appropriate to the theory. But if the theory has not been tested—that is, if it is still properly called a hypothesis—we can only say that we *assume* the validity of the hypothesis. The validity of our findings depends partly on the validity of the economic theory used.

In many cases it will be necessary to choose among economic

⁵ H. S. Ellis, "The State of the 'New Economics,'" 39 *American Economic Review*, 476, March 1949.

hypotheses. Stone⁶ and Prest⁷ have used confluence analysis in selecting variables for their demand equations. They assume that every observed variable consists of a systematic part (which may be related to the other variables in the demand equation in question) and a disturbance (consisting of variables like the "y's" in equation (2) above). The systematic part of an observed variable may improve our ability to explain other observed variables; the accompanying disturbance has the opposite effect. Confluence analysis is a method of determining whether the systematic effect predominates over the disturbance effect—and thus whether it is wise to include the suspect variable in the equation under consideration.

If variables are to be selected by the use of confluence analysis, and then parameters are to be estimated by the use of the limited information method, we must remember that the former assumes an error model, while the latter assumes a shock model. In terms of equations (1) and (4) above, the problem can be stated as follows: when we are deciding whether to include the variable I^* does the unrecognized presence of variables $x_1 \dots x_n$ impair our judgment to such an extent that confluence analysis ought not to be combined with the limited information method?

Apparently, no analysis of this problem is available. But there is the following reason for thinking that confluence analysis ought to be retained: the unrecognized presence of $x_1 \dots x_n$ spoils our prediction whether I^* is included in our model or not. Let us make the comparatively mild assumption that each x is uncorrelated with I^* . Then it appears reasonable to expect that failing to consider the "x's" will have the same effect on our prediction, whether I^* is included or excluded. If this conclusion is valid, the fact that we shall later use the limited information method does not rule out the use of confluence analysis in construction of the model.

In general, there is need for considerable work on the subject of testing hypotheses in economic problems. Suppose a group of hypotheses deal with demand and supply equations. By what Cohen and Nagel call the "deductive development of hypotheses,"⁸ we can "deduce" from a given set of equations some predictions about

⁶ *Op. cit.*

⁷ *Op. cit.*

⁸ Morris R. Cohen and Ernest Nagel, *An Introduction to Logic and Scientific Method*, New York, Harcourt, Brace, and Company, 1934.

future prices and quantities. We shall probably not be able to predict these prices and quantities exactly. But a hypothesis that predicts better than any other over an extended period of time has a relatively strong claim to be used in further prediction.⁹

When we limit ourselves to "predicting" past prices and quantities, it is difficult to choose among hypotheses. If we restrict ourselves to polynomial equations, we can make certain choices. If series x is being used to predict series y , we may choose between a first and second degree equation by observing the improvement in "fit," in relation to the loss of a degree of freedom. But no such procedure is available when we compare the results of two prediction equations, only one of which is a polynomial. It is not legitimate to compare the degrees of freedom in the two cases.

This degrees-of-freedom difficulty seems unavoidable as long as we deal with "fit." But when we use two equations to predict observations that have not been used in estimating the parameters of either equation, it appears that we need not concern ourselves with degrees of freedom. Since the predicted values have not been used to determine the predictions, we may be able to compare closeness of prediction directly.¹⁰

Some variant of this procedure may deserve experimentation. For instance, we may want to go back to using the first $\frac{2}{3}$ of a set of series in predicted certain values in the last $\frac{1}{3}$.

⁹ It is assumed that each hypothesis tested is suggested by some such process as introspection—that it is not chosen by selecting statistical series at random.

¹⁰ However, it might be necessary to refuse to predict when the values of the variables used in predicting fall outside the range of values used in setting up the estimation equating.

USING PRICE RESEARCH

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I HAVE been asked to discuss the use and acceptance of statistical price analyses that have been made in the agricultural field in California by farmers, farmers' organizations, and others for whom the material must in the end be intended.

First, what about the farmer and price research? In most cases he receives only the "answers" of price research in the form of general outlook information. Where prices are not established or supported by government, his price information is most likely to be only qualitative.

Farmers' marketing organizations for handling California specialty crops request and use considerable statistical price analyses as a guide in their operations. What we are talking about here and now is not market information, but statistical price analyses, which measure quantitatively price changes caused by or associated with changes in certain variables. Some of these organizations' particular need for price analyses arises from the fact that their commodity is only marketed during a very short period in the year. In some instances the whole of the crop must be sold at once in a market which has had no transactions for a year. Their market cannot be tested periodically, nor is price focused sharply for them as it is in the case of commodities sold on highly organized exchanges. We might parenthetically say, nor are the commodities they handle designated commodities in Price Support legislation, which, of course, would set up some mark with respect to where prices might be.

Farmers' cooperative bargaining organizations selling processing fruits and vegetables, perhaps, use more statistical analysis in their price problems than most other groups. Their problem is peculiar in that price for their product is usually a negotiated price. Prices are established only once a year for a short season. In between seasons, no price exists. Where should price be established this season? Who knows? That is the problem for the negotiators, and they want what scientific help that is useful—to their ends. We are told by these farmer bargaining organizations that they use these price analyses in crystallizing their thoughts about the market.

Grower organizations handling fresh fruits and vegetables do

not have the same kind of need for price analysis as do organizations selling to processors, who must sell the whole of the crop at once on a cold, unknown market. In the case of citrus, price analyses have long been used by grower organizations to assist in determining a desirable utilization of the season's crop. What is needed and what is lacking, however, is some price analysis to guide action during periods within a season.

Industry Marketing Control Committees. We have in California a number of marketing agreements and orders operating under both federal and state statutes. While the federal and state government officials alone have the power to make the regulations, they do receive and study the recommendations of industry advisory committees. We should point out that with the exception of milk, prices themselves cannot be regulated. However, prices can be greatly influenced by other powers, such as control of supplies and sizes, market stimulation, etc.

What use, then, do these industry control committees make of price research? Usually it is necessary to prepare quite a little analysis of price behavior for presentation at the hearings to institute a program. A survey of opinion indicates that by and large most committees do not use detailed price analyses after programs have been instituted.

Processors, handlers, and their organizations use some price analysis and, in addition, spend considerable funds in obtaining other relevant data. Price analyses are used by several companies as a guide in sizing up the market situation and, in some instances, in determining offering prices to producers. However, factors other than statistical price analysis may and do determine "offering prices." Price analysis is also used by some companies for current situation appraisal, as well as for determining bases for future operations. Some in this group expect to place more reliance upon statistical price analysis as times "become more normal" in this post-war period. Some say they used price analysis to a considerable extent in the prewar period.

In conclusion I might make the following observations:

- (1) In California statistical price analyses are used more by growers organizations and market control program committees than by individual farmers.
- (2) Statistical price analyses for farmers' organizations are perhaps most useful in selling commodities to processors.

- (3) Results of statistical price analyses thus far appears less useful and bargaining more difficult where there are multiple utilizations of the product.
- (4) Farmers' organizations and handlers want more price analyses whether they actually use them or not. They expect them to be more useful as more post-war data become available.
- (5) For general farm audiences the "case" method of presentation receives good attention.
- (6) The author of involved mathematical price analysis designed for some immediate operating problem should himself present the analysis to the operating group.
- (7) Industry groups make little or no use of price analysis to precisely maximize returns. Available data are not exact enough to be definitely sure that returns can really be precisely maximized by any course of action.
- (8) A byproduct of price research is the recognition of necessary and more complete data. Perhaps more cooperation is needed between persons gathering statistics and the analysts.
- (9) It appears to me that the areas of usefulness and the limits of price research are not well staked out. Some folks place more reliance in price analysis than is justified; others are perhaps unduly scornful.

MAKING PRICE RESEARCH USEFUL

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IN COMMENTING on this subject I would like to point out that: (1) in the early stages we asked and were offered too much in our price analysis research; (2) our price analysis research has not made its full contribution during the past decade and a half; (3) the need for the contributions of price research has increased many fold; (4) what we need is basic quantitative economic measurements which the operating forecaster and policy maker may use; and, (5) we should not delay our activities in this field waiting for methods which will give us the same degree of accuracy that may be obtained in the natural sciences.

Price research has not kept pace with the growth in price forecasting or price policy making. We have continued to expand work in agricultural outlook and in agricultural price policy without quantitative price research making the contribution to these activities which it should and could make.

In the 1920's we expected too much. We were looking for a statistical formula to predict prices of individual commodities. Some statisticians in their enthusiasm gave it to us. When economic conditions changed and the relationships and weights assigned to the various factors were no longer applicable to the new economic conditions, the formula forecasting fell into disrepute. With this set-back, caution arose concerning any complicated mathematical approach to price research.

Analyses need to be made by individuals or groups of individuals who are fully familiar not only with statistical procedure but also economic theory and a full knowledge of the characteristics of the commodity involved. We, also, need to make this data available in understandable form to the many individuals working in the outlook and policy fields.

We have before the nation proposals to make direct payments to farmers for the amount the free market price of the commodity averages below the announced support price. Empirically derived supply and demand functions are needed to complete economic models which will provide estimates of the effects (including costs) of such a pricing program under assumed or historic conditions.

These are not mythical problems, they are altogether too real. Discussions are being carried on and decisions are being made without the full benefit of quantitative price analysis research.

If we turn to the outlook field or where price information is used as a guide to private operations where do we find adequate statistical data showing supply and demand relationships? In making an appraisal of the hog outlook, for instance, one really sets up a model, although most of us do not think of it in these terms. We have reasonably good estimates of hog farrowings. Let us assume that we arrive at a forecast of an acceptable level of disposable income. With such a disposable income, what would be a statistically reliable demand function for pork products? Marketing costs are readily predictable a year ahead. The prices paid for pork may thus be calculated and in turn the prices for hogs. I recognize that we have changing demand schedules for pork, but let the forecaster or the operating outlook worker have the knowledge of how demand has operated under various situations.

The point I'm trying to make and to emphasize is that the econometrician should provide the basic pieces of price data which the operating agricultural forecaster and the agricultural policy maker needs to make a quantitative analysis of any current situation. The outlooker and the policy worker must choose what price data or model pertains to the situation involved. The econometrician should be interested in building a large base of fundamental data which those working directly in the applied economic fields may use. I am inclined to believe that there is much useful price data that has been prepared and is being used by individuals working in the price forecasting field that might profitably be published and made available to many others.

Our price research resources call for the use of the most simple, least time consuming techniques. Complex models—by the very fact that they are models and that no one is a "divine mathematician" are simplifications that must be judged with the intuition called experience. We must keep in mind that if they are to be valuable they must be used by others. The use of the simpler methods also leads to a more critical view of the results. In some instances it has almost appeared that the object was to keep the presentation involved. There is less tendency to swallow a brass doorknob if it isn't so elaborately wrapped.

In price analysis we need to break away from the natural

sciences' 95 to 99 percent limits of probability as the key to whether findings are significant. We should not wait until we have reached these limits. There are too many changes with time which the statistical approach probably can never measure, to strive for too high a degree of statistical accuracy in the price area. It is like striving to put a razor edge on a soapstone. The fundamental relationships of the factors used are too unstable to justify too high a degree of refinement.

One cannot discuss the subject of making price analysis research more useful without mentioning the need for more complete statistical data. This includes not only the gathering of data but also making it available in a usable series. We have made much progress in this area; nevertheless, there are still many gaps. The marketing processes should be more fully described. We need more data on governmental action programs, which not only include dollar data but also bushels and acres. We also need more regional information.

Because much of our price analysis is national in scope, I should like to raise the question—do we not need more coordination in price research? Far be it from me to propose that all price research be included and stereotyped into one great project. Yet, maybe we could make more progress and make more fully available the necessary information if we took a partial lesson from the approach used in the development of the atomic bomb. Perhaps the alternative is enlarged activities in the Bureau of Agricultural Economics, closely geared to the more specialized activities carried on in the States.

MEASURING THE INCOMES OF FARM PEOPLE

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WE KNOW something about the incomes of farm people—but not nearly enough. We know approximately what their total income has amounted to in any given year; and from the number of persons on farms, the number of farm workers, or the number of farm operators, we can compute simple arithmetic averages of their individual incomes. But we know very little about how the total income is distributed among farm families. We can also compare averages of farm income with corresponding averages of nonfarm income. But we are not sure just how "comparable" the figures really are.

This lack of detailed knowledge with respect to the distribution and comparative level of farm income arises in good part from the indirect methods that must be used in its estimation. Treating agriculture as though it were a single large firm, we estimate its gross income, its production expenses, and its net income from a wide variety of data on farm production, marketings, prices, and costs that have been collected primarily for other purposes. The method yields aggregates only, in terms of current values prevalent at the farm; and while the results are probably fairly reliable for what they purport to be, they are nevertheless inadequate for some purposes.

For the general purpose of indicating the comparative well-being of farm people, there are three major inadequacies: (1) Lack of state estimates of net farm income, (2) an absence of any satisfactory basis for comparison with nonfarm incomes, and (3) a dearth of acceptable data relating to size distributions. The method used in developing the national aggregates is also adaptable to state estimates; and a start has been made in their preparation. Thus, the only difficult problem in the case of state estimates is that of trying to do the job with insufficient resources.

In the areas of comparison and size distribution, however, some conceptual and statistical problems are as yet unresolved. It is the purpose of this paper to indicate something as to the nature of these problems and to provide a brief summary of the tentative results obtained in several recent attempts at their solution.

Problems of Comparison

In any attempt to compare the absolute levels of farm and non-farm incomes in terms of data now available, three principal questions arise: (1) How complete are the respective totals in their coverage of income? (2) What is the difference in their purchasing power? and (3) What is the most satisfactory unit or basis for comparison?

Completeness of coverage has to do chiefly with the fact that many people receive income from both farm and nonfarm sources, so that a simple average comparison of farm and nonfarm incomes may give distorted and misleading results. The problem may be handled by including all sources of income on both sides of the comparison, or by limiting the comparison to those groups that have but a single source of income. The latter course probably presents more statistical difficulties than does the former in the present state of our knowledge; and it is subject to further objection in that the scope of the comparison is defined in terms of the incomes to be compared.

Other factors to be considered under the heading of coverage are the intangible elements of income associated with the comparative advantages and disadvantages of farming as a way of life. Few would deny that farm life provides a psychic form of income that is not generally enjoyed by urban populations. Is this psychic income wholly or partially offset by economic disadvantages that are not reflected in our income data? The question is not amenable to statistical treatment; but it should not be forgotten in the final analysis.

The question of purchasing power has to do with (1) differences in the composition of commodities and services that go to make up comparable levels of economic well-being on the farm and in the city, and (2) differences in the cost of similar items in the two situations. Paradoxically, the very fact of large differences increases the difficulty of measuring them accurately; and the basic index-number problem becomes especially acute in this case. The theoretical issues involved are well known, and need not be developed here; but the most important practical problem, namely the valuation of nonmoney income, deserves a brief mention.

With the possible exception of members of the armed forces, farmers are the only large group to receive a major portion of their income in kind. Farm-produced food and fuel wood consumed

directly in farm households is ordinarily valued at cost in terms of prices actually received for the sale of similar products. And the occupancy value of farm dwellings, inseparable in the market from the rental or sale values of farms as a whole, is also imputed as something approaching opportunity cost. How are these items to be treated in measuring differences in purchasing power or "cost of living"?

One possible solution is to eliminate them completely from the monetary comparison. That is to say, income on both sides of the comparison could be defined as net money income after deducting all expenses for food, fuel, and housing. The comparison would then be in terms of income over and above that required for some of the basic necessities of life; and if desired, a supplementary comparison of the quantity and quality of the latter could be made in terms of physical instead of value units.¹

On the other hand, if these imputed, nonmoney items are retained in the monetary comparison, the cost-of-living analyst must answer some difficult questions. Retail prices of food normally average about twice as high as prices at the farm which are used in valuing home consumption. And the rental values assigned to farm dwellings have been only about a third as large, on the average, as rents on nonfarm dwelling units. How much of these spreads can be considered as representing real price differentials? And how much is due to differences in quality of the commodities and services being priced? The problem is particularly difficult in the case of rental values because housing available on the farm is frequently of an entirely different kind from that available in the city.

The third major question in any comparison of farm and non-farm income is the appropriate basis for that comparison. That is to say, the aggregates of income, however adjusted, must be reduced to units of comparable size and quality. Should the comparison be in terms of income per person in the total population on the basis of farm or nonfarm residence? In terms of income per worker on the basis of occupation? Or in terms of income per family on the basis of either residence or occupation? Because of the relatively large numbers of children and older people on farms,

¹ Some proposals of this general nature were tentatively suggested by Dorothy S. Brady in a paper presented at the 1949 meeting of the Conference on Research in Income and Wealth.

the large proportion of unpaid family workers in the farm labor force, and the relatively large size of the average farm family, the choice among these or other alternatives obviously will have a material effect on the results to be obtained.

Another question in this connection is whether the comparison should be in terms of simple, nation-wide averages of income, or whether farm and nonfarm incomes might better be compared within each region or state. The latter basis would give results somewhat more favorable than the former to the farm side of the comparison, because a large proportion of the farm population and only a relatively small part of the nonfarm populations are in the south where incomes in general, both farm and nonfarm, tend to be lower than average.

It is no part of the purpose of this paper to try to provide any final answers. But it may be worth while to summarize briefly the results obtained in two recent and tentative studies which attacked these problems on a nation-wide basis.²

In one case, 1941 data on prices paid for family living by farmers and by urban wage earners, obtained primarily from the study of "Family Spending and Saving in Wartime," were combined into weighted index numbers representing the average price differential between farm and city. The 1941 average net income per farm operator from farming was then adjusted downward to eliminate an estimated average value of unpaid family labor other than that of the operator; and the result was compared with the average annual earnings of factory workers in the light of the price differential previously established. The conclusion was that the purchasing power of farmers' incomes so adjusted averaged about 25 percent less in 1941 than that of urban factory workers. Similar calculations for 1945 were also made in this study, using price data translated to reflect the wartime situation; and the results indicated approximate equality of purchasing power as between farm operators and factory wage earners in that year.

In the other study, a series of rather complicated adjustments were applied directly to the BAE data on per capita farm incomes to achieve rough purchasing power comparability with nonfarm

² One of these studies appears as "Farm and Urban Purchasing Power" by Nathan Koffsky in Volume 11 of *Studies in Income and Wealth*, Conference on Research in Income and Wealth, National Bureau of Economic Research, New York, 1949, pp. 153-178. The other is summarized in the "Comment" of E. W. Grove appearing in the same volume, pp. 212-215.

per capita income. The results were then adjusted to allow for differences in the regional distribution of the farm and non farm populations and in the average size of the family in the two groups. It was concluded that, for the United States as a whole, real incomes of farm and nonfarm families in the same general locality averaged about equal in 1945, but that a disparity of at least 25 percent prevailed in most prewar years.

In neither of these studies was the comparison based on a functional analysis of income. Total incomes were compared, in other words, without any special attempt to distinguish returns from land, capital, labor, and management on either side of the comparison. In other respects, however, the two studies differed considerably in their approach to the problem. In one case, the labor income of the average factory worker was compared with the average farmer's composite returns on his capital, labor, and management, but exclusive of any income from nonfarm sources. In the other case, average total income of nonfarm families from all sources was compared with the corresponding average total income for families living on farms.

Because of these differences between the two studies in the basis for comparison, their respective conclusions are not strictly comparable. And both, it may be noted, were based on income data that have since been revised. Yet they tend to reinforce each other in pointing to the general conclusion that during the last three or four years farmers may reasonably be considered to have achieved something approaching income equality with the rest of the country.

But this "equality," if real, is only in terms of nation-wide averages of income; and we are not yet able to say very much about income relationships in individual states. Such limited data as are available suggest that during the last few years farmers in certain parts of the Western and North Central regions of the country may actually have been a good deal better off than nonfarmers in those areas. And at the other end of the scale, particularly in certain parts of the South, it seems equally likely that farmers have remained at a substantial disadvantage even during the general farm prosperity of recent years. It is possible, therefore, that average equality for agriculture has been achieved in part at the expense of greater relative inequality *within* agriculture. But firm conclusions on this score are not possible in the present state of our knowledge.

Distribution by Size

Thus far we have been concerned with totals and averages of farm income, and with problems of comparison. But even if we had complete and up-to-date data of this kind, which could be interpreted precisely from a comparative standpoint, the absence of size distributions of income would still prove to be a serious lack. The comparison of average incomes needs to be supplemented with information as to how many of who get how much.

Commonly cited in this connection are the Census of Agriculture distributions of farms by value of sales or by total value of product. These distributions are useful, but they are incomplete. We need distributions of farmers' net income as well as their gross income. And we also need to know how the distribution of farm families by size of net farm income is changed when income from nonfarm sources is taken into account.

The Bureau of Agricultural Economics has done a good deal of work along these lines in recent years. It has recently completed some preliminary estimates of size distributions relating to the income of farm-operator families in 1946. But this is another field in which it is difficult to obtain conclusive answers, and we are not yet ready to say that our results are the best that can be achieved. The preliminary findings were reported to the Conference on Research in Income and Wealth earlier this year, primarily for the purpose of obtaining a technical review of the statistical adjustments applied to the original survey data. As a result of this review further investigations of the data and refinements of procedure are now in process; and the distributions may be materially revised in the near future.

Nevertheless, the results obtained so far seem fairly reasonable, and some of the main findings are not likely to be very much affected by any future revisions. So the following summary of methods and results can be presented with little fear of contradiction in the final analysis.

The distributions were based largely on data relating to farm income and expenses for the calendar year 1946, collected in the Enumerative Survey of Agriculture in January 1947. More than 14,000 usable schedules were obtained on gross cash farm income and about 3,700 usable schedules on production expenses. As in other recent income surveys conducted by other governmental agencies, the BAE survey was characterized by underenumeration of farms and underreporting of income. Underenumeration was not

a serious difficulty because sufficient control data were obtained in the survey to permit expansion of the sample to the number of farms reported in the 1945 Census of Agriculture, using three major size-of-farm groups. It is to be noted that the underenumeration was largely in the smaller farms; this is primarily a reflection of the difficulty of identifying them as farms according to the Census definition.

The heart of the difficulty in constructing reliable size distributions of farmers' incomes lies in the severe underreporting of income which apparently is characteristic of farm income surveys. Receipts are generally understated, partly because of failure to remember the many transactions involved in the farm enterprise during the year, and also because of reluctance to disclose income data. These biases operate with greater force on the reporting of farm operators' income than on the reporting of income by most other occupational groups. Wage earners, for example, generally have fixed rates of earnings, easy to remember and report, and also relatively easy to check. In the companion survey of nonfarm incomes in 1946, conducted by the Bureau of the Census, more than 90 percent of total urban wages and salaries was accounted for in contrast with only about half of total net cash farm income in the farm survey. Under such circumstances, the necessity of adjusting the original distributions is self-evident, especially when comparisons are sought between farm and nonfarm groups.

After expansion to the 1945 Census number of farms, the survey accounted for 72 percent of the aggregate BAE estimate of cash farm receipts, 91 percent of estimated total production expenses, and only 49 percent of net cash farm income. There was a fairly consistent pattern in the extent of underreporting by regions, implying that the sample was rather uniform in coverage for different parts of the country. It is noteworthy that the value of sales as reported in the 1945 Census of Agriculture represented an understatement from the BAE aggregate of approximately the same percentage as occurred in the 1946 survey. Furthermore, the Census distribution of the value of sales is quite similar to the distribution of gross cash farm income obtained from the survey, particularly when allowance is made for the generally higher level of income in 1946.

The BAE totals of gross income, production expenses, and net income are themselves subject to errors of estimation; and the question naturally arises as to the propriety of adjusting the income

distributions to reflect aggregates which are not guaranteed to be correct. Yet the preponderance of evidence is on the side of adjustment. It is a characteristic of income surveys to underreport income, and the underreporting is usually greatest in the case of the self-employed, whether farm or nonfarm. In the 1946 surveys, nonfarm entrepreneurial income was underreported by about the same proportion as farm income. It should also be remembered that the Census of Agriculture is an income survey insofar as it relates to the value of sales or of total product; and as such it is subject to the limitations and biases of any income survey.

The relatively good reporting of farm production expenditures—91 percent of the estimated BAE aggregate—provided the opening step in adjusting the survey results. After raising all production expenses proportionately to reflect the BAE estimate, the corresponding gross cash farm income was determined by means of a relationship between gross cash income and production expenses at each income level determined largely from other sources. The survey covered the nonfarm income of farm-operator families, but excluded nonmoney income. By a series of cross-tabulations, however, and with the aid of data from other sources relating to the nonmoney income from farming, the following distributions were developed which reflected the BAE aggregate estimates: (1) Gross cash income from farming, (2) net cash income from farming, (3) net cash income from farm and nonfarm sources combined, and (4) net total income from farm and nonfarm sources, including nonmoney income from the farm.

In all cases, the distributions after adjustment are more unequal than before adjustment. This is because the available evidence indicated that most of the "missing" farm income belonged in the higher income groups, on the basis of the relationship between cash farm income and production expenses at those levels; and the adjustment was accomplished accordingly.

However, the greatest interest attaches to the lower income groups which were relatively little affected by the adjustment. In the distribution of gross cash farm income, the original survey indicated that 33 percent of all farms had gross cash incomes of less than \$500. After adjustment, the percentage was lowered only slightly to 29 percent. For *net* cash farm income, the original distribution indicated 33 percent with *negative* incomes, and the adjusted distribution 30 percent.

At first glance, the indication that almost a third of all farms had

negative net cash farm income in 1946—an unusually prosperous year for agriculture as a whole—may seem unreasonable. But after reference to the distribution of gross cash farm income, to the standard definition of a farm, and to the distribution of income from nonfarm sources, it begins to appear quite reasonable.

As already noted, nearly a third of all farms had gross cash farm incomes of less than \$500, a proportion that is substantially confirmed by the value-of-sales data from the Census of Agriculture. Approximately two-thirds of all negative net incomes fall in this group with relatively low gross farm income. It should be emphasized that for the most part these farms are not commercial operations. Some are primarily country residences. Others, supplemented by income from nonfarm sources, provide living from the farm in noncash items. The tremendous importance of nonfarm income to this group may be illustrated by comparing its average size at each level of net cash farm income. For those farm operators with negative cash income from farming, the average nonfarm income was \$1,700. At levels of net cash farm income above zero and ranging up to about \$6,000, income from nonfarm sources becomes substantially smaller, averaging around \$500 more or less at those levels. At still higher levels of farm income, nonfarm income again becomes increasingly larger in absolute terms, though it remains a relatively small part of total income at those higher levels. But the most significant point in all of this is that negative net cash farm incomes do not actually mean an excessively low level of total income for any substantial number of families who fall in that group.

Inventories are another matter worth mentioning in connection with negative cash farm incomes. One of the principal gaps in our data relates to the effect of changes in inventories on the distribution of income. The survey was confined to cash items, and did not obtain any information on inventories. But we know from a study of farm-account records in Illinois that some commercial farmers fall in the negative net cash farm income class because they are building up inventories. On the other hand, some farmers were in the higher cash income classes because they were selling out of inventories. Although no precise estimates can be made, the inclusion of farm inventory changes might have reduced considerably the number of farms in the negative income group.

For purposes of comparing the income distributions of farm and nonfarm families, it is appropriate to include for the farm-operator

family all the income it receives—cash farm income, income from nonfarm sources, and nonmoney income received from the farm in the form of food and shelter. It would also appear appropriate to value the food consumed on farms at retail prices to farmers. If all this is done, then the shape of the income distribution for farm-operator families in 1946 turns out to be much the same as that for nonfarm families.

* * *

It was concluded earlier in this paper that the over-all average incomes of farm and nonfarm families have probably had about the same real purchasing power during recent postwar years. And the further conclusion has now been reached that their incomes were probably distributed by size in somewhat the same fashion. But it does not necessarily follow from these two tentative and independent observations that the purchasing power of income was the same at each of the corresponding size classes in the two distributions. Much more detailed studies would be necessary to establish any such correspondence.

Three frontiers in farm-income research have been briefly considered here, namely the development of state totals, the comparison with nonfarm income, and the construction of size distributions. Some pioneer work has been done on all three. But so far the work on any one has been largely—and necessarily—*independent* of that on either of the other two. If and when the work shall have progressed to a point at which answers to all three can be combined, then, and not until then, will we really be able to measure the incomes of farm people.

REFLECTIONS ON POVERTY WITHIN AGRICULTURE*

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A Summary

The setting of this paper is the American scene, concentrating on the long run and abstracting from sudden changes and fluctuations that occur in the short run. The simplifying empirical propositions on which this paper stands are as follows:

1. The differences in the level of living among communities were not as great at the time people were pioneering new areas or at the time industrialization began as they have become since then.
2. Significant differences have emerged within agriculture not mainly because of a deterioration on the part of those communities in which people are now living under conditions of poverty, but largely because of the increases in per capita income that have been realized by other communities.
3. These gaps, consisting of differences in level of living, are basically the consequences of the way in which the economy of the United States has developed and not primarily the result of any original differences in the cultural values or capabilities of the people themselves.

Each of these propositions is meaningful in that an appeal can be made to empirical experience in determining its validity. The third proposition is central and crucial. The observation is made that the physical characteristics of land are passive in the poverty problem. The drift of prices is also in a passive position.

Can economic progress bring about increasing disparity of income? It could not if we were to take the classical conception of economic progress; that is, increases in aggregate income under conditions where per capita income tends to remain constant. This is the Ricardo-Malthus-Mill, "Dynamics of Political Economy." It is based on two rates of change: (1) power of production and (2) power of population with the power of production in the position of the limitational factor. Given this conception, communities do not diverge in per capita income.

A broader formulation of economic progress consists of increases in aggregate income with changes in per capita income unspecified, except that no community is made worse off. This view includes the Ricardo-Malthus-Mill conception as a special case. The principal analytical problem becomes that of specifying the *conditions that are necessary* for a disparity in per capita income to emerge.

The economic history of Western Europe since 1650 suggests that the advances in technology and in economic organization usually ascribed to the industrial revolution gave rise to (1) a greatly increased aggregate production, (2) a marked increase in per capita income generally in Europe despite the fact that the European population multiplied five times from 1650 to date, (3) an increasing disparity in per capita income between

* The full text of the paper presented at Laramie will appear in the Journal of Political Economy, vol. LVIII, February, 1950.

Western Europe (certainly up to World War II) and those parts of the world that had not benefited from the process of industrialization, and (4) conditions which impeded migration of non-Europeans to Europe, a development that would have brought about factor-price equalization to human agents between European and non-European communities had it occurred in sufficient numbers.

We then examine the conditions that are necessary for increasing disparity in incomes to occur. The effects of capital accumulation are indicated. The main analysis, however, concentrates on the following three sets of conditions:

1. Conditions that determine the proportion of a population that contributes to income. The ratio of contributors to non-contributors is affected by changes in composition of population associated with economic progress, changes in continuity of employment and the specialization permitted by division of labor that emerges with economic development, and by the differences ascribable to income measurement and to income accounting.
2. Conditions that determine the abilities of a population to produce. This approach calls for a classification of abilities. The abilities that can be acquired are of central interest. A brief survey is then made of the (1) process by which capital is "invested" in human agents; (2) amount thus invested; and (3) effects of this investment on productivity of a population.
3. Conditions that impede factor-price equalization. Economic progress requires exceedingly large transfers of human agents. An instructive special case is a pre-industrial demographic type of population under conditions that do not necessarily require any trade or factor movement to attain factor-price equalization. Transfer of factors is, however, necessary under advanced industrial demographic type (the Samuelson exception is noted) in order to attain factor-price equalization. There remains the difficult problem of determining the comparability of typical human agents in pre-industrial and advanced industrial demographic communities. It appears that we are dealing with essentially comparable factors with two types of exceptions. One of these occurs when long systematic training for specific skills is required and the other when ability to adapt in the short run is insufficient.

There are basic cultural impediments to factor-price equalization. These involve sociological considerations having costs aspects. For society, the gains to be achieved from paying the costs of reducing these cultural impediments are greatest when these costs are non-recurring for any migrant.

DISCUSSION

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Professor Schultz' major thesis, developed out of his analysis of the causes operative in creating disparities among economic levels of different

farm communities, is that poverty in rural areas is due to their having been by-passed in the processes of industrial progress. This analysis serves at least one very important purpose. It removes the responsibility for poverty from the individuals so affected, and fixes it upon the public. This justifies work on the problem by economists as being in the public interest, and support of their proposals, if sound ones be found, a public responsibility.

But there are certain methodological implications of the argument which I find quite uncomfortable. They find their clearest expression in the series of comments on what Professor Schultz refers to as "research concentrating on land." However, since I believe, along with him, that his conclusions on this point are necessary logical implications of his formulation of the problem, the following comments should have a bearing upon a much larger array of implications of his argument.

The question I should ask is: what kind of conception of causation can help remove or diminish poverty in agriculture? Implicitly, it seems to me, Professor Schultz' argument conceives of causation as being much like immutable impersonal forces. As we try, following this conception, to unravel the skein of causation involved in the creation of poverty in agriculture, we trace it back through human affairs, halting somewhat arbitrarily on the developmental processes of the country's economy. We could have, with equal logical precision, traced the pattern of causes by way of the unequal geographical development of the country, back to the uneven disposition of mineral and other natural resources. We thus need come to no logically imposed halting place until we find the explanation of our problem in the beneficence of the gods or the orneriness of the devils, as best suits our disposition. This conception of causation, as the working out of impersonal forces sweeping human affairs on to their destinies, serves quite well in transferring responsibility from the individuals affected to the public. For it is becoming almost a norm of our public morality that we do not allow individuals to suffer unaided the full brunt of disaster-bringing impersonal forces outside their control. For such a purpose, it doesn't matter much where we stop in our tracing out the path of causation, provided only that it is sufficiently far removed from the individuals we are interested in helping.

But the broader problem of finding ways of improving the level of living of the poorer people in agriculture makes more exacting demands upon our method. A conception of causes to be relevant in the problem and to have power in its solution must have its basic focus not upon present circumstances and their antecedents, but upon present possible courses of action and their probable consequence. This consequence-grounded conception of causation has been the uniquely American contribution to logical theory. In logical theory, the pragmatic conception of a cause is that which can be isolated and when brought under control will bring about a desired reconstruction of the situation under study. In the words of the great Chicago philosopher G. H. Mead, "Generally it (i.e. cause) is some condition which can be changed in order to bring about a different result."

If our analyses are to lead to acceptable and workable formulations of policies to follow in reducing rural poverty, they must be couched directly in terms of alternatives available in the situations in which poverty occurs,

and are only indirectly concerned with the "underlying causes" by which such poverty is explained. This consideration leads me directly to the conclusion that our contribution to the solution of the problem of rural poverty will come principally from intensive and systematic inquiry into the potentialities inherent in those situations in which poverty exists. This implies community and area studies bent on exploring the full array of available alternatives open to the poor people living in them. Especially it implies a study of local social and economic processes for an attempt to locate those strategic points at which specific public action can be most effective. (A study recently published in *Land Economics* of a very poor northern Wisconsin community revealed that most national programs designed to serve the general interest as depression remedies actually worked against the long-run interests of the people in the community.)

These public actions might include such general things as encouraging migration to other communities, development of new industries, better balancing of factors of farm production, and a rationalization of the relationship between institutions and the resources already in use. This, as I understand it, has been the principal objective of land economics research. Most such research worthy of the name has concentrated on the way in which land is incorporated as *uses* into the economic organization of the area in question. Far from being unable to reveal causes as Professor Schultz contends, they have, I believe been among the most useful of inquiries revealing causes—in the meaning of "causes" that I have sketched out, i.e. warranted clues to significant social action for relieving the communities' poverty.

It is true that land as such plays a passive role; but the way in which land is incorporated into the economic organization of a community is one of the really dynamic facts of rural life—just as the way coal and iron ore deposits, or isolation-imposing rugged terrain, are caught up in and give differential direction to the developmental processes of our country's economy. I refer again to the northern Wisconsin community mentioned before. Built upon a combination of agriculture and forestry as the economic base, the institutions of the community took form and solidified. Line fences and farmstead locations defined the scale of operations; legal and political institutions of private property defined the mode of economic organization; custom, habit and culturally acquired tastes made the people immobile and unimpressed by the call of better opportunities elsewhere. This process set the stage for great distress when the forests were depleted and the rich, thin top soil gave out. Analysis of these processes provides, I believe, the only source of clues to procedures to follow in improving the situation. Neither the terrific internal pressures of a disintegrating community economy during the depression, nor the external wartime pull of the people into military and industrial employment, left any significant decline in the number of people residing and trying to make a living in the community. No doubt similar circumstances of poverty induced by maladjustment in land uses—the rigidifying of institutions in situations demanding their flexibility—could be recounted for most important poverty-ridden areas in the country.

I certainly agree with Professor Schultz that agricultural economists

have contributed too little to the solution of poverty in agriculture and that this is not due primarily to coercive political pressure. But I cannot believe that they have neglected the study of rural poverty because, accepting the prevailing folklore, "they do not believe that poverty is an important social problem." I believe, rather, that we have neglected study of the problem because our basic methodologies—the hidden major premises of our research—have been such as to prevent our making powerful advances on the problem.

I have developed at some length the case for intensive investigation of local economic processes. This intimacy of insight into farmers' experiences was achieved in those empirical farm management studies in which more or less agricultural economics was born. But their purposes of improving farmers' judgments in the conduct of their private businesses led to the forging of methods of inquiry adapted to deal with the limited structure of alternatives open to individual farmers, but not adapted to encompass the broader array of alternatives open for public action.

At the other pole, we have seen a great deal of vitality emerge from the application of economic principles of theoretical equilibrium to the problems of agriculture. But this methodology, too, proves inadequate in dealing with the problem of poverty. This is the message we get from the fact that policy proposals repeatedly mention the problem of rural poverty and then issue an honest disclaimer of any important contribution to its solution. This I believe testifies to the inadequacies of the method rather than to the disinterest of the economists.

Why these inadequacies? First, this type of approach serves to define the solution of the problem in terms of a theoretical norm having little reference to the problem as it exists. This flows from the fabrication of this norm (i.e. the theoretical model) from such basic abstract postulates as pure competition, rationality of action (within a narrowly defined meaning of rationality) and perfect mobility of factors of production, including labor. The direction thus given to our analyses of present situations of poverty is to point them toward this completely abstracted, hypothetical state of affairs as being a "solution" to our problem—a state of affairs defined by a system of pure ideas, untested except for their logical consistency, a society without institutions, an economy without organization. Of course, we economists do not actually operate in that way; our minds are too dialectic to follow our methods to their logical conclusions. But some such vague perception of the implications of our methods leads us to detour when we ride theoretical analysis up to the problem of rural poverty. Second, human energies are released and directed into the economy principally by the operation of social processes. In large part, the supply and availability of labor as a productive agent is a by-product of social organization. (This I hope has been demonstrated in a research bulletin on *The Labor Foundations of Wisconsin Family Farms*.) Systematic inquiry into the processes by which such energies take form and are channeled into productive uses is only indirectly aided by a method of formulating the problem which abstracts from their existence. The point we must avoid overlooking is that labor is embodied in people, and the use to which labor is put depends upon the myriad decisions of the individual persons

involved. All that we know of the processes of personality development leads us to the conclusion that the person, and therefore the decisions he makes, is really a function of the social situation in which he builds his personality. Among many people, even poverty itself is held as a value. They perhaps do not think so. But their personalities are so much a function of their social habitat that their decisions, both deliberative and habitual, made out of a craving for what John R. Commons has called "the security of even injustice and poverty," lead to a continuation of the poverty in which they live.

Policies for dealing with these by-passed cells of our social economy must, unless we follow authoritarian procedures, work their way out through the free decisions of the people involved. An understanding of the processes of acculturation which give the particular character to these decisions is indispensable to the formulation of such policies. These processes, being distinctly strategic to the solution of an intensely economic problem, fall thereby directly within the province of economic investigation. We should not, through too critical use of the theoretical-equilibrium method of approaching our problem for analysis, beg this strategic area of investigation by covering all individual action under universal assumptions which give highly particular meanings to rational conduct and to the nature of individual choice.

DISCUSSION

HERMAN M. SOUTHWORTH
Council of Economic Advisers

I think we can be heartened by the papers presented here. The progress of farm income research described by Dr. Grove, and the preliminary estimates that he so tentatively reports, suggest to me that we are on the threshold of obtaining a much better quantitative description of the problem to which policy must address itself. And the insights provided by Professor Schultz in the synthesis that he has developed can, I believe, help us substantially in broadening our future policy approaches.

Legislatively, the time is ripe for a shift from price support over to income support as the basis for major farm programs, if only an acceptable formulation of our income objective can be provided.

Grove's discussion of the effects of making income comparisons within geographic regions is highly relevant to Schultz' analysis. The fact that farm-nonfarm disparities are so greatly reduced when viewed region by region supports the thesis that the basic disparities are between regions rather than between agriculture and other industries.

In one sense, Schultz reduces the phenomenon of poverty in agriculture—defined to include only inter-community disparities—to a problem in economics of location. In another sense he broadens it to typify the whole process of the industrial revolution, and, in effect, takes it out of the realm of agricultural economics. I find his thesis a rather convincing over-simplification, that presents an important class of disparities in farm incomes in a perspective that should be helpful in our efforts to understand this problem.

I should like to throw into the discussion a few policy proposals that

would seem at first sight to have the support of Schultz' analysis. I should not like them to be taken as proposals that I myself would advocate without qualification, since they obviously involve considerations going far beyond the scope of this discussion.

1. The support of farm income through price programs, that now occupies the center of policy consideration, is not designed to overcome poverty in agriculture as Schultz defines it.

2. Schultz places major emphasis upon positive action to overcome the cultural impediments that keep people from migrating from backward to progressive communities. Such action might include:

a. Much greater emphasis upon industrial and commercial, as versus agricultural, vocational education in rural schools in the "pre-industrial" communities.

b. The bringing of other modern community services and facilities to such areas, as a measure designed to reduce the unfamiliarity of their people with urban modes of life.

c. A program somewhat analogous to that of the Farmers Home Administration, but designed instead to help families that cannot make a decent living from farming to establish themselves successfully in urban employments.

It is not hard to dream up programs like these. The difficulty lies in envisioning how to carry them out without an objectionable amount of Federal paternalism.

3. We might make greater progress by abandoning efforts to deal with agricultural poverty as a *farm* problem and concentrating rather upon measures to reduce the discrepancies in *general* economic development between regions. Where the impediments are too great to moving people out of the "preindustrial" communities, should we not seek instead to bring industry to these communities?

4. I am also tempted to infer from Schultz' paper some support for the Employment Act of 1946, by which my own agency came into existence. The promotion of "maximum employment production, and purchasing power" for the whole United States involves extending to all parts of the country the economic development that Schultz describes as having bypassed many, especially agricultural, communities.

DISCUSSION

JOHN W. WHITE
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Mr. Grove, in his paper entitled "Measuring the Incomes of Farm People," presented in a very excellent manner the fact that some pioneer work has been done on three frontiers of the farm income measurement problem. The three income measurement frontiers listed by Mr. Grove were the development of state totals, the comparison of non-farm income, and the construction of size distributions.

I have referred to Mr. Grove's paper for the express purpose of emphasizing the point that according to his criteria we have not really measured farm income. Thus, what basis other than generalizations do we have for assuming that poverty exists in agriculture? Professor Schultz assumes that it does exist. I concur, but where? To what degree? And why?

I find no real basis for disagreeing with Professor Schultz's statement

that "differences in level of living are basically a consequence of the way in which the economy of the United States has developed." However, I do believe that Professor Schultz's presentation falls short of pin pointing actual trouble spots in given agricultural communities whether of high or low level of living.

In order to focus attention on the actual problem of poverty in agriculture and to examine some of the more plausible suggestions for solutions to the problem, I would like to take up a few examples.

In the fall of 1944, under conditions of short labor supply, the superintendent of a Southern experiment station found it necessary to haul labor to be used in farm and experimental tasks from a fringe area near the station. Monk Murphy, about 50 years old, was one of the laborers thus recruited. An investigation revealed that Monk lived in a tie-slab shack and had made an investment of \$8 in the construction of the shack. A nice four-room bungalow was available near the experiment station at a rental below the cost of transportation. When asked if he wished to move near the station Monk gave several delaying answers one at a time each good for one week's delay. The first answer was that he could not afford to lose what he had in his house; the second, that he must wait until one of a flock of six hens hatched a setting of eggs; the third revealed that his wife was afraid to move out on a paved highway for fear a car might run over their six year old son.

Finally Monk agreed to move and unloaded his furniture and placed it on the porch of the four room bungalow, which was equipped with good screens, a good water pump and a sanitary outdoor toilet. He came to see the Superintendent and asked if he might place his bed, cook stove, heating stove, dining table and other necessities all in the front room with the explanation that he and his family did not need the other rooms. Thus, Monk set up housekeeping in his new environment.

Even though he was paid each Saturday, it was necessary to advance money about Wednesday or Thursday of each week. If he bought groceries on Monday he did so on a charge account. Monk was a good tractor driver, if someone kept the tractor in repair, saw that it was filled with water, oil and fuel and greased at proper intervals.

By and by Monk failed to see that any good could come from actually working. The station Superintendent found it necessary to discharge Monk. Monk moved to a nearby town and started living in another shack in the town slums.

A more hopeful case is that of Cecil Smith. Cecil, about 30 years old, was a capable farm laborer who had at one time grown rice and cotton as a share cropper. Cecil finished the eighth grade and his wife was a high school graduate. He wanted very much to give his two children a chance to attend school. Cecil was a skilled tractor operator and could with a minimum of supervision do a very satisfactory job on almost any farm task. It was impossible for him to accumulate capital to be used in developing skills for industrial work, for the purchase of equipment to use in operating rented land or for the purchase of a farm. Cecil's major hope or best outlook is to purchase a small farm in a good neighborhood with access to churches, schools and good roads.

Our third example is John Smith, about 40 years old, with a wife and four children. He possessed a debt-free upland farm of 80 acres with 50 acres in cultivation or tillable pasture. Since markets were not available for fruit, truck, dairy or poultry products, his major source of cash income was the production from about 15 acres of cotton. Roads, schools and churches were poor in John's community.

Would a price policy guaranteeing 90 percent of parity for John's cotton solve his problem or alleviate his poverty? I doubt if it would—of course, it might take John longer to starve to death with a 90 percent support price for cotton.

John may need more capital for use in increasing the size of his business. Perhaps this should be supplied on a business basis by the government. Part of the increased capital should be used to purchase mechanical equipment to go with the increased size of business. Public research could contribute much to John's efforts to raise his level of living. A vigorous research program aimed at the development of improved crops, irrigation, proper land use and most profitable combination of enterprises would be helpful. Good local, state and Federal government programs to improve roads, schools and other public services would help. Perhaps John's children should be given an opportunity to prepare themselves for non-farm employment.

Professor Schultz concludes in his paper that society could achieve a *very considerable* gain by taking positive actions (providing the costs are non-reoccurring) to diminish the adverse effects of cultural impediments which influence disparities in income and contribute to the causes of unequal incomes between communities. This conclusion calls for consideration of the double problem of how economic progress could be promoted in low level communities and how we could eliminate or substantially diminish obvious cases of poverty in both high and low level communities.

I would like to leave with you a number of questions which I believe must be considered in dealing with this problem. These questions are:

- (1) Could the problem be solved in large part by individual farmers through the application of all the techniques available to them?
- (2) Could the problem be solved partially through better education, and through improvement in roads, churches and similar institutions?
- (3) Could the problem be solved partially through a continued and more vigorous program of research and application of such research?
- (4) Could the problem be solved partially through public expenditures for drainage and flood control?
- (5) Could the problem be solved partially through greater industrialization in low income areas and through a better balance between agriculture and industry?

Any solution to the problem of poverty must take into account minority and racial groups in the area concerned. The racial problem is of vast importance and is extremely complex. Is it possible to legislate equality all across the board? The racial question deserves the considered study of our best students. To the extent that poverty exists in Southern agriculture, it is interwoven with the racial question which complicates most of the efforts which might contribute to the solution.

INSTITUTIONAL CHANGES AFFECTING THE AGRI-CULTURAL OUTLOOK; THE AGRICULTURAL PERSPECTIVE

KENNETH H. PARSONS
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ANY attempt in one brief essay at evaluating changes in the basic institutions which affect the outlook for agriculture must be highly selective. We have chosen to concentrate our comments upon changes in two major institutions, general farm organizations and the judicial interpretation of farm legislation.

I count myself among those who use the term "institutions" sparingly; it is a term of many meanings. It is used most often by economists as a blanket term to cover whatever is left over as an unexplained residue after a mechanical analysis has been pushed to its limits. Institutions in this view are conceived of as impediments to the free and full play of economic forces, as the source of inertia in adjustments, stickiness in prices, etc. Institutions are viewed as slowing down the economic mechanism much as long grass chokes up lawn mowers. As I see it, this conception proceeds from the analytical postulate of viewing the economy as a mechanism, presumably governed by mechanical laws which we call forces—forces being equivalent technically to something unknown outside the mechanism.

Obviously, if one is to comment on institutional changes with any systematic reference to economic thought, he must have a conception of an institution which both has some positive and specifiable content, and is relevant to economic investigation. In America, we have had at least two major efforts to formulate systematically a conception of economics which actually incorporated the investigation of institutions into the body of general economic analysis.

One of these was the creation of Thorstein Veblen. He ultimately reduced an institution to a habit of thought, which he conceived of as being a rather natural growth from our habits of work. One might call this a psychological conception of an institution. This viewpoint is to be found at its best, I think, in *Imperial Germany and the Industrial Revolution*.¹ This study, written before the first

¹ Originally published as, Thorstein Veblen, *Imperial Germany and the Industrial Revolution*, The Macmillan Co., New York, 1915.

World War, presented an amazingly accurate forecast of the major European developments since that time. The key, I think, is to be found in the enormous social consequences of "the way we think" about social questions—our habits of thought. Surely, there has been a profound change in recent decades in the habits of thought among our people regarding agricultural policy.

John R. Commons worked out a quite different approach to economics, which is also called institutional. In his analysis, he conceived of an institution as "collective action in control, liberation, and expansion of individual action."² In this general viewpoint, the economy is viewed as a created social organization. Commons investigated many forces of collective action, including public administration, industrial government and trade unions. His *Legal Foundations of Capitalism*³ will likely stand as the greatest published monument to his investigational genius.

In a very profound and yet very different way each of these men was attempting to rise above the limitations of a purely mechanical systematic analysis in economics. All major policy questions are concerned with institutions, with social organization. Public policy formation in a huge democracy such as ours requires the participation of countless pressure groups, along with all the branches of government. Unless economic analysis comes to grips in some fundamental way with the structure of the relevant social action, it can have only very limited influence in the shaping of agricultural policy.

I shall not try to conceal my own inclination to build upon Commons' viewpoint in the analysis of economic institutions. For purposes of this comment I am going to interpret changes in institutions as being equivalent to changes in organized collective action. This includes the conduct of both farm organizations and public officials in the execution of public policies.

Any attempt at evaluation of the effects of changes in institutions carries with it implicitly the idea that we can deliberately and of our own volition give direction to economic affairs. The directing is done through organized effort, through a revision of the working rules by which social activity is organized. The great economic problems of our time have their roots in our elementary

² See his *Institutional Economics*, The Macmillan Co., New York, 1934; and *The Economics of Collective Action*, scheduled for publication in the fall of 1949 by The Macmillan Co.

³ The Macmillan Co., New York, 1924 and 1939.

institutions. We have developed an economic system with vast aggregations of economic power, within a system of property relations designed originally for an era of handicrafts. A laissez-faire philosophy of government in our time leads to economic instability, gross inequalities, and a free hand for economic power.

The changes in farmers' attitudes toward government and their renewed faith in the possibilities of public action, are symptomatic of our times. No one, I think, would claim that we know precisely what to do. It is quite clear to most of us that the new situations require new procedures in social organization. In the most fundamental sense the outlook for agriculture is dependent upon what we do in social and economic organization. The outlook therefore is not a matter of discovering the determinate outcome of mechanical economic forces but rather of anticipating the consequences of deliberate conduct. In the broad view even production and resource utilization are by-products of the social (including economic) organization, for the simple reason that both are consequences of human ingenuity and volition applied to mere matter.

I

As we turn to the discussion of the significance of changes in institutions it is necessary to stake out some particular time span for consideration, preferably a period which might reasonably be called an epoch. And even at best such interpretations can be no more than the beginning general hypotheses for a systematic investigation into the facts of the matter. We shall look back to the approximate close of the first World War, and then attempt an evaluation of present directions by projecting our interpretations about an equal distance into the future. This gives us some rough markings from which we can take our bearings.

In the early twenties, the Grange had a membership of about half a million persons. The Farmers Union had about a hundred thousand and the Farm Bureau about three to 400 thousand members. Each of these organizations was at a different period of its career; the Grange was well along on the gradual climb in membership from the slump in activities of the early eighties; the Farmers Union had dropped from the early flush of members from 1910 to 1920; and the Farm Bureau was in a period of gradual decline which ran from 1921 to about 1934.⁴ Altogether about one million

⁴ Data on membership in farmer movements from David Edgar Lindstrom, *American Farmers and Rural Organization*, The Garrard Press, 1948, Champaign, Ill., Part III, pp. 161 ff.

farmers belonged to these movements in the early 1920's.

There was no striking change in membership until about 1940. By 1946, the Grange reported 750,000 members; the Farm Bureau more than a million (1,128,259), and the Farmers Union about 140,000. This gives a total of more than two million members, more than half of which were in the Farm Bureau.

We have the phenomenon of an increasing membership during times of unparalleled prosperity. It has been observed frequently that the growth of farm organizations has represented something of a spontaneous protest of inarticulate but distressed farmers who found themselves helpless as individuals. There is strong evidence in the history of farmer movements to support this thesis.⁵

If one were to investigate the why of this great increase in membership during recent prosperity, he would likely find that this reflects a growing uneasiness on the part of individual farmers regarding their helplessness as individuals in a world increasingly dominated by the great forms of collective action: corporations, labor unions and political parties.⁶ We are undergoing, I believe, a profound change in farmers' habits of thought on this point, and many group efforts contribute to it, including the AAA and the Soil Conservation districts, and membership in their marketing and purchasing cooperatives. One might say that a new class consciousness is developing among farmers; new in the sense that it centers on a newly acquired conviction not only that something can be done by farmers collectively about economic policy matters, but that if they do not work together they will be lost in the shuffle of power groups in the economic order that is in the making.

The recent growth in farm organizations may also reflect changes in the structure of farm organizations themselves. They are acquiring professional secretaries and trained staffs. I do not see how there could be any alternative if the organizations are to deal adequately with the problems that a national organization faces which attempts to contribute to both policy formation and general supervision of the many cooperative and educational endeavors within the province of a contemporary farm organization.

This professionalization of the organizations may be very significant. At best the participating "dirt" farmers will be able to

⁵ See for example, R. L. Hunt, *History of Farmer Movements in the Southwest, 1873-1925*, Dallas, Texas, 1936, pp. III and 142; Solon Buck, *Granger Movement*, Harvard Press, Cambridge, Mass., 1918.

⁶ See John R. Commons' forthcoming *Economics of Collective Action*, The Macmillan Co., 1949.

give only general direction to organizational policies, and even then much would depend upon the willingness of the officials to be so advised. At best also, the directors of the organization will find themselves much like public administrators with a "civil servant" problem in the sense that they will be dependent upon the technical interpretations supplied by their staffs. There are all degrees of possible variation from this optimum. Not the least of the difficulties of organizations in the matter of professional personnel, one may suppose, is the reluctance of agricultural economists to accept employment which might brand them as special pleaders for a pressure group. When an organization arrives at the paid secretary stage the officers take on a considerable management function, speaking for the group on crucial policy questions.

The decline in the importance of face-to-face relationships and the rise to power of a professional leadership group is part of the natural development of organizations. But it opens up the possibility of greater conflicts between the membership and the leadership, an even more likely prospect among farm organizations than among those representing either big capital or labor. Labor organizations have long concentrated on the security of the job; they are now pushing out into politics to supplement, safeguard and expand their job status with more general securities. Big business can concentrate on keeping the restrictions off "free enterprise." But general farm organizations must expend energy in countless places on the economic front, to "protect farmers" by fighting something of a defensive rear-guard action in a triumphant groupistic industrialism.

Farmers have little economic power, even with the present extent of organization. Labor unions and corporations may proceed toward their economic objectives, without active government support, or even in defiance of government. But economic programs for farmers must be details in general political programs. Representatives of farmers must engage continuously in making alliances on specific issues over which there is room for genuine differences in judgment. In a general way organized agriculture is agreed that some kind of national agricultural program is necessary, including at least minimum price supports. Whether farmers as a prospective small minority will continue to be successful in working out the political strategy necessary to achieve such programs is an open question.

Organized agriculture is caught up in larger struggles over which

farmers have little control. The central figures in the great struggles of today and the years ahead are surely as Professor Commons has observed, capital, labor and political parties. Among the general farm organizations only the Farmers Union is openly friendly to organized labor. It is in the cooperative field where the fundamental conflict between capital and labor hits organized agriculture the hardest.

If one attempts to look ahead for two or three decades, what consequences may be anticipated on this capital-labor front that are of major concern to agriculture? I do not see anything except industrial civil war in which farmers might alternate between choosing sides and attempting to remain neutral, except as we develop a new conception of the public interest in private affairs. The outlook is not as dreary as the remark might imply, simply because we are already making that transition. In an age where the employment, inventory and investment policies of our huge corporations can and do materially affect the level of prosperity in an economy, conduct on such matters cannot be considered wholly a private affair. Similarly with labor, it is clear that there is a limit to the extent of strikes that can be tolerated, and correlatively the wage demands that public opinion can reasonably support. On the farm front it is easier for farmers to serve the public interest in their private efforts in economic matters. They can do little else, excepting as they waste the resources upon which the public is dependent. The general principle here is to see that private and public are not contradictory and conflicting purposes. It is at bottom a question of how, when, and whether the private interest also serves the public interest.

Farm organizations also face a whole host of delicate problems in politics. So far, the politics of the organizations appear to be compounded of geography and economics. But farm organizations have not entered openly into politics in recent years as have labor organizations. Organized labor has not only decided to use its political power as a supplement to its economic power, it is predominantly in the Democratic camp. However, the political situation among organized farmers is somewhat chaotic. The Grange operates in predominantly Republican territory. But we have recently been treated to the twin spectacle of having the Farmers Union territory go Republican with a president who has staunchly supported the social legislation of both the New Deal and the Fair Deal;

while the officers of the American Farm Bureau have taken on a fight over the Brannan plan as an early sequel to an election where midwest farmers' votes shifted to the Democrats.

If one can draw an interpretative inference from this political jumble it would seem to be about this: among interest groups only labor approaches the strength required to challenge a political party. With political parties being necessarily so powerful in the years ahead, farmers are likely to place fundamental reliance upon them, and for reasons quite independent of farm organization policies.

II

Twenty-five years ago the fight over the McNary-Haugen bill was nearing a climax. The Farm Bureau had just endorsed the effort. A feud was on between Mr. Hoover, then Secretary of Commerce and the Secretary of Agriculture over the jurisdiction over marketing work. The outcome, as you know well, included the passage of the McNary-Haugen bill by Congress and its successful veto by President Coolidge. As a part of this same struggle, the B.A.E. was "reorganized" with H. C. Taylor moving on to other fields.⁷

The history of agricultural legislation since that time is so familiar to all of you that I shall not take your time to comment extensively upon it. But there have been some significant developments in the judicial interpretation of legislation with which we may not be equally familiar.

Agricultural economists were forcibly reminded of the existence and power of the U.S. Supreme Court in the Butler case⁸ in 1936 which demolished the production control and processing tax features of the first AAA. The majority held in this case that agricultural production was a matter of state concern, and was not included among the powers delegated to the federal government. The marketing agreements authority of the AAA was not affected by this decision. Since that time the AAA has taken a swing toward conservation, but the drift of events has kept pushing this program back toward price supports, acreage controls and marketing quotas.

The authority of the federal government to regulate market transactions in agricultural products and fix prices seems thoroughly

⁷ See Orville Merton Kile, *The Farm Bureau Through Three Decades*, The Waverly Press, Baltimore, 1948, Chap. XI, "The Battle for McNary-Haugenism."

⁸ U.S. vs Butler, 297 U.S. 1 (1936).

established, provided only that due process of law is observed and delegation of legislative power is avoided. The leading cases in this area at present are those involving the regulation of fluid milk markets under federal order in New York City and Boston; the Rock-Royal and Hood cases.⁹

The critical question in the Rock-Royal case was whether Congress had violated the federal constitution by delegating legislative authority to the executive in the office of the Secretary of Agriculture. The majority held that no such delegation was involved. The court noted the general purpose of the Agricultural Adjustment Act to establish parity prices and included in their opinion the statement of purpose familiar to all of you.¹⁰ The court recognized also the particular provisions of the law for calculation of the parity price of milk but observed that: "This price cannot be determined by mathematical formula but the standards give ample indications of the various factors to be considered by the secretary."¹¹

The general rule which the court accepted in dealing with "questions of economic adjustment" was stated as: "In dealing with legislation involving questions of economic adjustment, each enactment must be considered to determine whether it states the purpose which the Congress seeks to accomplish and the standards by which that purpose is to be worked out with sufficient exactness to enable those affected to understand these limits."¹²

The court compared the Agricultural Adjustment Act with the former NIRA, which it disposed of in the famous Schechter case. The court noted that the purpose of the AAA was "to restore parity prices" and that the "terms of the orders were limited to specific provisions, minutely set out."¹³ On the contrary the declaration of policy in the NIRA was couched in the most general terms including: "to eliminate unfair competitive practices, to promote the fullest possible utilization of the present productive capacity of industries, to avoid undue restriction of production (except as may be temporarily required), to increase the consumption of industrial and agricultural products by increasing purchasing power, etc."¹⁴ The significance of this comparison will be evident if it is recalled that the NIRA was declared unconstitutional on this spe-

⁹ U.S. vs Rock-Royal Cooperative, 307 U.S. 533, 1938; Hood & Sons vs U.S. 307 U.S. 588, 1938.

¹⁰ U.S. 307, 574-575.

¹¹ *Ibid.*, p. 577.

¹² *Ibid.*, p. 574.

¹³ *Ibid.*, p. 575.

¹⁴ *Ibid.*, p. 575.

cific question, namely the delegation of legislative authority.

The general conclusion with respect to the Court's stand on the delegation of authority is clear: where the Congress indicates with sufficient exactness the purpose of legislation and the methods by which that purpose is to be worked out, the Secretary of Agriculture is considered to be merely carrying out the indicated will of Congress.

As I study these cases two inferences emerge as of major concern to our discussion today. One, the power of the federal government to regulate and fix prices is established solidly, provided the procedure does not violate the constitutional provisions of the separation of powers and honors due process of law. But this suggests the question, just how specific does the price formula have to be to avoid delegation of authority? It is impressive, to put it mildly, how the court fastens onto the concept and formulae for parity prices. Now we have in this association heard a great deal of criticism of parity prices. Several members have given attention to alternative price criteria, notably forward prices. The question arises as to whether the court could, or would, find that a price support program based upon forward prices would qualify under its general rule for legislation on economic adjustments, namely, that the "standards" by which an exactly stated purpose is to be worked out are stated "with sufficient exactness to enable those affected to understand these limits."¹⁵ The proposed forward price program includes (a) the granting of authority to an administrative agency to determine and enforce (as minima) authoritative equilibrium prices, and (b) equilibrium prices are defined in the technical economic terms of ideal prices which would equate marginal costs and marginal returns in agricultural production.¹⁶ If one takes the Rock-Royal case as the criterion, I doubt whether the forward price proposal could be drafted with sufficiently obvious content and exactness to meet the constitutional test on delegation of powers on any issue of regulating prices.

In two cases subsequent to the Butler case which invalidated the major part of the first AAA the government's right to enforce production control regulations has been clearly established.¹⁷

In the first, a North Carolina case on tobacco, marketing quotas

¹⁵ 307 U.S. 574.

¹⁶ See Gale Johnson's *Forward Prices for Agriculture*, University of Chicago Press, 1947.

¹⁷ *Milford vs Smith*, 307 U.S. 38 (1938), and *Wickard v. Filburn*, 317 U.S. 111 (1942).

were accepted by the court as falling completely within the congressional authority under the interstate commerce clause, as the procedure for making allotments was spelled out so as not to "confer unrestrained arbitrary power on an executive office."

In *Wickard vs Filburn* the court appears not only to have sustained marketing quotas but to have gone the whole way in recognizing the right of the government to regulate production. Mr. Filburn, an Ohio farmer, had planted 23 acres of wheat with an acreage allotment of 11.1 acres. He fed the excess marketing surplus of 239 bushels, preferring not to take advantage of the loan provisions. The court ruled that he was subject to the penalty of \$4.49 a bushel or \$117.11. The opinion was unanimous.

In this opinion the court concluded with the following declaration of policy which may have wide application:

"That the appellee is the worse off for the aggregate of this legislation does not appear; it only appears that, if he could get all that the government gives and do nothing that the government asks, he would be better off than the law allows. To deny him this is not to deny him due process of law."¹⁸ Professor Sears in his recent review of Supreme Court Opinions¹⁹ noted that this opinion seemed very important, "perhaps the most important opinion under the commerce clause since Chief Justice Marshall delivered his memorable opinion in *Gibbons vs Ogburn*"²⁰ in 1824.

I do not present these remarks on the court decisions as anything more than suggestive comments. But surely the decisions are not to be taken lightly. And it is no real criticism of the cases to observe that the court may again change its collective mind on these questions as the times and the composition of the court change. In our system of political economy it is left to the supreme court to rationalize such changes in the rules as may be necessary to permit the orderly transformation of our society. This is the great safety valve in our economic system, and is ultimately the means of orderly rather than violent revolution.

III

If one were to deal at all adequately with the significance to farm people of prospective institutional changes, he would have to con-

¹⁸ *Wickard vs Filburn* 317, U.S. 111.

¹⁹ Kenneth C. Sears, "The Supreme Court and the New Deal: An Answer to Texas," 12, *University of Chicago Law Review*, 148, 1944.

²⁰ *Gibbons vs Ogburn*, 22 U.S. 1, 1824.

sider many more aspects of collective action. In the broad view it is clear that we are engaged in the tremendous task of changing the working rules of economic organization in an effort to cope with the problems of a new era. Since the first World War, we have made a strenuous effort to reduce the instability and insecurity in American agriculture and in the economy generally. The problems for agriculture have been complicated by the ominous fact that farmers are little folks in an age of great combinations. However, as I read the record, I have no doubt either that we can or will in the proximate future avoid depressions of the magnitude of those of the '20's and '30's. The relatively bright outlook for agriculture is darkened only by the contingency of war on a grand scale. Barring this catastrophe the major task of economic policy is that of changing the working rules to twentieth century specifications.

CURRENT INSTITUTIONAL TRENDS IN BUSINESS

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Kraft Foods Company

I SHALL begin this paper with a definition and a premise. The definition has to do with the word "institutional." By institutional trends in business, I shall mean (1) changes in the size and scale of the enterprise unit, (2) changes in ownership form (i.e. individual, corporate, cooperative or public) and, (3) in the method by which economic equilibrium is achieved.

My premise is that economic institutions are the result of, and are shaped by, the technology of the times. Since commerce and industry began, commercial organization has gone through several cycles of change. Economic historians tell us, for instance, that the framework of modern big business has been sketched several times during the past 2,000 years. The small, specialized business unit has dominated the trade of one era, the large and far-flung enterprise has dominated the trade of another. And back of these changes in business organization have been changes in the techniques of production, communication, transportation and distribution as they were developed in each of these eras.

I am aware that there are many who contend that economic institutions can and should be *consciously* shaped according to some set of eternal verities or moral values which men try to define in terms of good and bad. I am not of this school. Basically, though to some extent an over-simplification, I think it is true that the economic history and progress of mankind is to be explained in terms of economic determinism. If we must think of economic institutions in terms of good and bad, and these are very intangible concepts, my view is that those institutions and forms of economic organization are best which are most likely to develop and utilize modern techniques of producing and distributing economic goods and services.

The most important economic development of the past 50 years is the tendency toward greater size and scale in all parts and phases of the economy. This is true in business, in labor, and to a lesser extent, in agriculture. Without such an increase in enterprise scale, modern techniques of mass production and mass distribution could not possibly have been applied. Yet there continues in many quarters a prejudice against economic size per se—whether exemplified in big business, big labor, or big agriculture. This unreasoned preju-

dice is traceable in large part, I think, to a failure to understand the nature of economic institutions and why they never can or should resemble those which prevailed 200 years ago.

It is important first that we make clear the universal nature of this trend toward scale. In industry, it has mainly taken the form of corporate growth; in labor it is exemplified by the federation of individual workers into unions capable of wielding economic power on an industry-wide basis; and in agriculture, both by an increase in the size of the family farm, and by the agricultural cooperative movement. It is important also to realize that in business organization, this increase in scale has taken place at *all* size levels. Enterprises of scale are not confined to the so-called national companies, although this is what people commonly have in mind when they refer to big business. Probably even more important is the less publicized increase in the average size of what we ordinarily refer to as "small" business. For the truth is that much so-called small business is not small at all, if by that term we have in mind an enterprise the capital for which can ordinarily be supplied by one or a few men. Certainly a locally-owned manufacturing establishment worth a million dollars and employing upwards of a hundred people can hardly be called a family-sized unit. But except for the fields of agriculture, retail distribution and the services, how much of our economy is today comprised of units smaller than that?

What is back of this trend toward larger business units? The answer to increasing scale throughout our economy is to be found in modern technology, which has broken apart the business forms and institutions of a by-gone era and forged new ones to give itself expression.

One could go on all day listing examples of how technological innovation has been related to subsequent changes in business forms, and I shall confine myself here to only a few examples from the food industries. The meat packing industry as we know it today owes its origin to the introduction of the refrigerator car about 1875, which made it possible to concentrate livestock slaughter in the production areas. With slaughter thus concentrated geographically, it was possible to apply mass production methods to the slaughtering process and the reclamation of animal by-products. Likewise, the mill roll and separation of flour by means of air current, plus the application of modern power, took the flour milling industry out of the grist mill era. Vegetable canning, bread baking, cheese processing—the most modern and efficient tech-

niques for doing all these things require single plant expenditures running into the hundreds of thousands and even millions of dollars.

Equally important as a factor in the growth of large-scale enterprise have been the techniques of mass distribution. As a matter of fact, economies of distribution are probably more important than economies of plant production in the evolving of companies from a local to a regional to a national basis. Here again there is a technological basis so obvious that its relevance is seldom noted. For instance, why didn't chain stores and mass distribution evolve 100 years ago? The answer is simply that mass distribution could evolve only with modern techniques of record keeping, of communication and transportation. Imagine if you can, trying to conduct mass retailing without the typewriter, the adding machine, the cash register, and the automobile.

Another factor to be noted is the revelance of technology for the function of business management. Modern means of communication make it possible for the skills of management to be extended over a business enterprise which is national or even international in scope. One of the important factors in the growth of large enterprise is the use of specialized skills in management—special skills in merchandising, production, purchasing, research and all other elements that go to make up business operation. Not even a genius can combine all these special management skills. Here again some of our old economic principles are wrong when we try to apply them today, because classical economics taught that management was a limiting factor to the size of business enterprise, and they wrongly applied to the factor of management the principle of diminishing returns. As a matter of fact, the economic principle of division of labor is as applicable to the function of management as it is to hand labor, and the curious failure of some of the older economists to observe this may have been due to the fact that in those days the prevailing technology did not permit geographical extension of the management function.

By emphasizing technology as a factor for larger size in business enterprise, I have not meant to leave the impression that there is not an important place in the economy for small enterprise. Small enterprise is, and probably will continue to be, the predominant enterprise scale in many lines.

In agriculture, for instance, modern machines for production—the tractor, the combine, the corn picker, the milking machine—can be efficiently used on a family-sized unit. The most efficient

machines it would be possible to design for these types of work probably would require large amounts of land and capital, but this efficiency factor difference has not thus far proved sufficient for large-scale farming to make headway comparable to large-scale enterprise in many lines of industrial manufacturing.

Similarly, there are many parts of industry, particularly in distribution and the services, where technology has not been compelling in its effect on economic institutions. The most important development in food retailing during the past 15 years has not been the growth of regional and national chains as it was during the decade of the 1920's, but rather an improvement in the methods and efficiency of the independent retailer. Self service retailing and the integration of the wholesale and retail function through the cooperative efforts of independent retailers have given them as well as the corporate chains many of the advantages of mass retailing.

In the field of industrial manufacturing, there is of course a mixed picture. In some of the heavy industries—automobiles, steel, airplane construction—modern production methods leave no place for what can properly be called small-scale enterprise. But there are many lines of fabrication and processing where this is not true, and where medium-sized and even small units can compete on the basis of approximately equal productive efficiency.

This is especially true in the field of food processing, which explains why most lines of food processing are a healthy admixture of hundreds and even thousands of firms, ranging in scale from family-sized units to national corporations. One cannot describe in a paragraph the business pattern in the food industries, because each line is different. But generally speaking, you will find in every major line from three to ten concerns operating on a national basis; then a considerably larger number, similar in structure and using similar techniques and distribution, operating on a regional basis; and finally, hundreds of smaller independently-owned units, varying widely in size and type, doing business on a local basis.

From the standpoint of the number of firms involved, and the variety of techniques of production and distribution to be found, the food industries are probably the most competitive of any major sector of the economy. Concentration of control has not proceeded as far as in some other industries, and for technological reasons probably never will. This does not necessarily mean that the food industries are serving the people any better or any worse than other

sectors where the organizational pattern of business is different. All I am saying here is that the number of firms and their pattern as to size and type is more diverse in foods than in most other major lines.

I want to move now to some observations regarding the applicability of economic theory to modern business organization. The main purpose of economic theory should be to enable us to understand, appraise and improve the economy. And I submit that for that purpose, much of our economic theory today is either inadequate or downright misleading.

When the older economists laid out their theory of value, they ordinarily dealt with the matter of price and output under two assumptions as to competition. On the one side, they took what the economist calls perfect competition, i.e. a large number of small firms no one of which has enough volume to influence price, and on the other side they put single-firm monopoly. Then under the assumption that the small firms and the large firms used approximately the same techniques of production and that the supply function would be the same in both cases, it was easy to demonstrate that the output of a commodity would be larger and its price lower under conditions of perfect competition than under conditions of single-firm monopoly. From this false set of cost assumptions, they and some of their modern followers went on to conclude that any departure from the conditions of perfect competition as thus defined was not in the public interest. The final step in such reasoning is to conclude that a reduction in the number of firms, or an increase in concentration of control which is the same thing, is necessarily bad.

The first thing wrong is the wholly unrealistic assumption as to the cost function. Imagine if you can, the cost of making all the parts of an automobile and then putting it together under conditions of perfect competition as an economist defines that term. Put another way, would you rather buy a car off the assembly line in Detroit, or one put together by a garage mechanic from parts made in 10,000 blacksmith shops? This is an extreme example, but it illustrates how utterly ridiculous it is to draw a line on a piece of paper representing a hypothetical supply function, and then another line to represent the demand function with rectangles and squares and triangles—and from this to draw the most solemn conclusions as to price and output under conditions of perfect competition versus duopoly or oligopoly.

Under the heading of oligopoly theory, some of the later theorists have attempted to give us a set of tools more adequate to the understanding of price making in a modern economy. They say that under oligopoly, the solution depends on how any one of the firms involved may react to the action of its competitors, and since this is neither knowable or predictable, it follows that the outcome as to price and output is indeterminate. Another way to say this is that oligopoly may lead to conspiracy to fix prices, to wholesome competition, or to cut-throat competition, and on the basis of economic theory no one can tell which or where or when one or the other of these situations is most likely to prevail. And when the problem is further complicated, as in reality it is, by taking the cost function into account, who can say on the basis of economic theory at what point concentration of control is inimical to the public interest?

I stated at the outset that the most important institutional change in business is the trend toward greater scale. The second most important change, as I see it, is a greater rigidity in the structure of costs and prices. In my opinion, price levels will never again be as flexible as they were 30 or even 20 years ago, and I don't think any of us really want them to be, although there are some dangers in the direction we are drifting.

Many people associate price inflexibility with the growth of large scale business enterprise. But this has not been the major factor, nor even a very important one. The chief reason for price inflexibility is cost inflexibility resulting from the power of organized labor to influence and control hourly wage rates. In saying this, I am not passing judgment on the matter, but simply pointing out that business today no longer exercises the control it once did over its major cost factor, wages.

One can scarcely pick up a newspaper these days without finding a pronouncement to the effect that prices to consumers have not fallen as much as they should have, and that business is somehow to blame. Currently the food industries are the most common targets for charges of this kind because the spread between the farm and retail price of food has held steady as farm prices have started to decline.

Usually in these charges there is the implication that business profits are too high. In the food field, the net profits of processors are averaging from two to three percent per dollar of sales; and for food distributors, between one and two percent. You can argue that this level of profits is too high or too low; but you can't argue

that a reduction, or even the abolishment of profits in the food field would lead to any significant reduction in food prices. This is so obvious that it hardly merits mention before a group of this kind, but for the amount of newspaper space recently taken up with pronouncements to the contrary.

If food prices or the prices of goods and services generally are to be significantly reduced in the short run, it can come about only through a reduction in the price of raw materials or of wage costs. It has become the policy of government, probably not soon to be abandoned, to put floors under the prices of many of our raw materials, especially those grown on farms. Again I am not passing judgment, but only pointing out another major cause of price rigidity in our economy.

These two developments—more rigid wage rates and raw material prices externally controlled—have great significance for business management. They mean first that the business concern has lost in considerable measure the control of its cost elements. Business is, therefore, considerably more vulnerable to changing economic conditions than ever before. Industrial profits today are being made under conditions of approximate maximum output, with a high break-even point and with relatively inflexible costs. This is not necessarily a prediction of disaster, but it is important that government and labor and agriculture as well as business realize that when a piece of metal is too rigid to bend, it must sometimes break. I am aware that there is a broad and growing school of thought among economists and leaders in all industrial fields who believe intelligently and sincerely that with proper economic statesmanship we can maintain conditions of full employment under a comparatively rigid price and wage structure. I am partly of this belief myself, but with the qualification that we are on new and somewhat dangerous ground in this matter of economic adjustment.

This much is certain: *We cannot have a falling or a rising price structure without a falling or a rising cost structure.* And I further believe we cannot forever guarantee and maintain a fixed level of prices by means of government expenditure and deficit financing without some day going bankrupt in the process. In times past and under a different set of economic institutions, the necessary adjustment of price levels to effective demand, and of costs to price levels, was made by the blind exercise of economic forces—but made nevertheless. Today economic adjustment is in considerable part

the outcome of bargaining and negotiation between corporations and labor unions and cooperatives, with the government itself increasingly a participant. Under these circumstances, economic adjustment is no longer automatic, but in large part administered or negotiated or legislated. This is inevitable and I think our economy can cope with it. But economic power in the hands of whatever group, including the government itself, can be a dangerous thing unless directed wisely and, to a greater extent than heretofore, unselfishly. I believe our economy will stand or fall on this issue, and I am one of those who think it will stand.

What does all this mean for the individual—in terms of his material well-being, his economic security, the satisfaction of his ambitions?

The main purpose of an economy of whatever kind—be it one of small business, large business, free enterprise or socialism—is to turn out the largest possible supply of goods at the least cost in terms of human effort, and then to distribute these goods in accordance with the contribution of those who have helped to produce them. The first test for any set of economic institutions is the extent to which they serve the material needs of the people. And the first requisite for this is that our economic institutions permit the development of and give expression to those techniques of production and distribution which are most efficient in a physical sense. Measured by this standard, the performance of American business enterprise is unmatched.

On the second count—economic security for the individual—there is considerable room for improvement. The quicker all of us come to admit this and get down to doing something about it in commonsense terms, the more secure our free enterprise system will be. Business itself can do a great deal—and much has already been done—to regularize and plan production schedules so that employment is as regular and steady as management can make it. But this in itself is not enough, because management cannot guarantee employment in the face of financial loss.

Those who oppose additional social security, with funds contributed jointly by employees, employers and government are a small and diminishing band. But in this altogether laudable objective of great economic security for the individual, let's not overlook two things. The first is that social security, like other good things, represents a cost to society; and we must pay for it in part by deductions from our wages, in part by having its costs added to the prices

of the goods we buy, and in part by additional taxes. Social security is not something that can be squeezed out of business profits in some magic fashion. Moreover, we must be on guard against justifying indolence in the name of social security.

Finally, our economic institutions must give incentive to the individual and the enterprise group. This is the essence of the free enterprise system and the thing which chiefly distinguishes it from the various forms of socialism.

One of the criticisms commonly made against corporate enterprise versus small individual enterprise is that it stifles the individual. It is one of our traditions that the goal of achievement in business is to own and control an enterprise of one's own, and when young men seek the advice of their elders they are in most cases still solemnly advised to go into business for themselves. It is time we looked at this, too, in more realistic fashion. For the truth is that only a very small percentage of people can ever be individual enterprisers in this sense because ours is no longer predominantly an economy of small business.

Some of you may have seen the results of a recent poll of college graduates conducted by *Fortune Magazine* in which a majority indicated their preference for work with large corporations, or with the government or in the field of education, in preference to going into business for themselves. The poll-taker was somewhat worried that the spirit of enterprise was going out of young men, though I think his fears were groundless. The important thing about this poll and the point I want to make in connection with it is that an increasing number of people think they can find satisfaction for their ambitions by working within groups and organizations rather than as individuals.

What I have tried to demonstrate in this paper is the relationship between men, machines, and economic institutions. It may seem an oversimplification, but I think basically the relationship is a causal one. Through their ingenuity and resourcefulness, men have developed a technology requiring greater scale of enterprise. Economic institutions adequate and proper to the simpler technology of an earlier age have had to give way to modern business and industrial forms of organization. Changing institutions have in turn had their effect on men, their ideals, their values and their relationships to each other. In short, under our private enterprise system we are moving from economic individualism in the old sense to economic groupism.

LABOR'S AIMS AND WHAT THEY MEAN TO AGRICULTURE

DONALD MONTGOMERY

UAW-CIO

YOU ask me to discuss developments in organized labor that affect the outlook for agriculture.

I shall conclude: 1, that agriculture need not expect organized labor to accept a reduction in wage rates; 2, that agriculture need not fear that organized labor will join forces with those who hope to drive farm prices down; 3, that agriculture should welcome and share in organized labor's primary objective, which is the maintenance of continuous and expanding full production and full employment year after year.

These conclusions are based upon a review and interpretation of labor's progress toward increased purchasing power over the last 35 years. After reviewing that progress, I shall try to interpret for you labor's experience in these years and the new objectives that have grown out of this experience. Then we can see what it means to agriculture.

I

The record of labor's progress toward increased purchasing power since 1914 shows:

1. Until 1944 there was an almost unbroken yearly increase in the hourly wage. In only seven years did the money wage fail to increase, and in only four (not the same) years did the real wage fail to gain.

2. Labor has won more through increased wages than through falling prices. In 23 of these years prices were rising, and in those years the increase of the real hourly wage averaged nearly four index points a year. In 11 years of falling prices, the real wage increase averaged less than two index points. In short, labor did better in good times than in bad times. It has not been proved to labor that it can make progress by accepting a stable wage rate while waiting for industry or agriculture to reduce prices.

3. Buying power of the hourly wage held up well during the depression, but this did not prevent a disastrous fall in the buying power of total wage income. This was the beginning of an experi-

ence which has had great significance in shaping labor's present objectives.

4. Labor won a striking increase in its hourly wage rate in 1934. This reflected the declared policy of the government in favor of higher wages and in support of labor unions. Such official support was an important new experience for labor.

5. Another major increase in the hourly wage took place in 1937. This followed the first large development of industrial unions and the invasion of the basic open-shop industries by organized labor. Union membership had dropped from five million in 1920 to less than three million in 1933, but in 1937 it suddenly increased to seven million. Organization continued after 1937 and the hourly wage continued to rise.

6. From 1939 to 1944 the rise in the hourly wage was quite overshadowed by the great increase in buying power of total wages. Here was concrete experience with full production and full employment. Here was proof of what full employment could mean.

7. After 1944 came the first significant decline in the real hourly wage during all this period. The 36 cent rise in money wage since 1944 was wiped out by price increases. The reduction in hours and employment resulted in a 30 percent reduction in the buying power of total wages. This is another important chapter in labor experience creating a primary interest in full employment.

8. While the money wage and the real wage both made gains between 1948 and June 1949, the buying power of wage income fell because plants were shutting down and workers were being laid off. This rounds out the experience which began with the depression 20 years ago.

II

Now let us clothe this statistical skeleton with living issues. What new purposes has labor discovered out of this experience?

1. There is, first, the proof that organization pays. Compare, for example, labor's gains during the alleged prosperity of the '20's with the gains it made during the limited recovery of the '30's. In the earlier period union membership fell from five to three million. It rose from less than three million in 1933 to nine million in 1939. Increase of the hourly wage in the later period was $3\frac{1}{2}$ times its increase in the earlier years. Buying power of the total wage increased 50 percent during the '20's; 100 percent from 1932 to 1939.

Success of industrial unionism in basic mass production industries was the key to this striking success in the 1930's. The strongholds of monopoly power and the open shop had been breached. Labor had effectively challenged the anti-labor low-wage policies of these basic industries.

2. The war and postwar years brought labor new experience and new interest with respect to prices. Both wages and prices were under government control during the war. These controls were tied together. Labor had to concern itself with both, and gained a lively awareness of the difference between money wages and real wages. Out of this experience labor's postwar wage demands called for increased real wages to be paid out of profits without an increase in prices. This labor objective was based on the belief that distribution of the proceeds of full production must provide purchasing power sufficient to support full production. But industry rejected this proposal. After dealing price control its death blow in the early months of 1946, key industries took the lead in agreeing to wage increases which, round by round, they used as an excuse to increase their prices and to add to their profits.

Many people were convinced by this experience that industry was right when it said wages could not be raised without raising prices, the proof, to them, being that industry *did* raise prices whenever it raised wages. But organized labor was and is convinced of the soundness of its wage-price-profit proposals. For it has seen the tremendous profits which industry made as its price increases cancelled out wage increases. It has seen the resulting decline in buying power of wage income. It has heard industrial leaders say that they must accumulate profits in boom years in order to provide dividends for the bust years which will follow.

3. This experience gives rise to labor's primary new objective—that affirmative measures can and must be taken to eradicate booms and busts and to maintain production and employment at rising capacity levels year after year. The lesson was learned in three stages.

The depression which began twenty years ago convinced most people that something must be done to prevent the waste of human labor and the human misery of such catastrophes. That was lesson one. Lesson two was the experience of full employment during the war—if we have it for war, we can have it for peace. The postwar decline in labor's buying power, followed by the closing of plants

and the laying off of workers, provided lesson three—that something more than the voluntary performance of private enterprise is necessary to prevent booms and busts and to make full production and full employment a continuing reality.

Labor knows that booms and busts are not gifts of nature, but man-made. It believes that what is man-made can be man-controlled. In place of the controls imposed on the economy by leaders of big business, it calls for controls in which all economic groups may participate. For the *private* planning by monopoly industries, it would substitute responsible *public* planning. It urges that government fiscal policies be designed to stimulate levels of consumer buying power and investment adequate to support full production and to promote its expansion.

Private enterprise also welcomes government aid, indeed demands it. Labor's program differs only because it wants government as a full partner in the process. It is business, not labor, that has been inviting the government into private enterprise all these years, but always on a heads-we-win-tails-you-lose basis, beginning with Hoover's Federal Farm Board and Hoover's Reconstruction Finance Corporation 20 years ago. Labor's plan is radical only in that it would have government promote successful enterprise, not merely mop up the failures.

These full employment objectives of labor are spelled out, though imperfectly, in the proposed Economic Expansion Act of 1949, recently introduced in Congress. It proclaims purposes which we endorse, but tends to leave government as the silent, rather than the active, partner to private enterprise, assigning to it the menial task of subsidizing the imperfections of business instead of the bold task of promoting positive performance on behalf of the general good. I think labor will back this measure if it can be changed to provide a creative purpose, rather than a crutch, for the American economy.

4. Pursuit of our full employment objective involves another—political action. Labor is in politics for keeps. It is in politics to cope with a basic issue of our times—the issue of the private power of monopoly vs. the public power of the people. This is the question that arises out of labor's postwar experience with wages, prices, profits, employment and production. Shall we have private government of the economy or public government?

To come to grips with this issue we must concern ourselves about the exercise of public power. We do not intend that government autocrats shall substitute themselves for economic autocrats. We must get into the governing process. That is, we must get into politics. We? Not only labor, but all of the American people who live by their labor rather than by their property.

III

What does all this mean to agriculture? Back in the 'twenties labor's drive centered largely on a higher wage per hour, and for only a select few within the ranks of labor. That being so, the farmer's problem was remote. Cheap prices for food were desirable, no matter what they might mean to food producers.

This certainly is not labor's view today. Labor sees that the purpose of farm price supports is similar to its own purposes in collective bargaining. The farm program began during the depression at the same time as the organizing drive which brought labor unions their great increase in membership. And the purpose was the same —to provide human security against the onslaught of economic forces. And the opposition comes from the same quarter. The attack upon farm price supports, the demand that farm prices be left to unfettered supply and demand, the proposal that each farmer should decide in isolation how much acreage to till or livestock to feed, have come from the same financial and industrial sources that still hope to divide labor, to destroy its collective bargaining power and to drive it back to competitive wages.

Labor endorses farm price supports. It wants food as cheap as it can buy it, but not at the expense of sweatshop farming. This is not based on sentiment but on a recognition of common interest. Organized labor has little reason to be grateful to organized farmers. It has experienced a hostility from that quarter which could force a fatal rift between them were it not for the fact that so many organized workers were born on farms and so many more have family ties reaching back to those who work the land. They know farming is hard work and hazardous. And they have seen the farmer's principal crop, his sons and daughters, come to the factories to work and fight side by side with other workers to protect their rights as human beings against the inhumanities of the factory system.

But labor's most important support for the farm price support program is its determination to achieve steady full employment and production at good wages. For only full employment can assure good markets, and price supports are in peril if markets collapse. The security which the farm family wins through price supports is as vulnerable as the security which the worker's family wins through collective bargaining. A return of depression can destroy both. Even a continuation of the present "corrective adjustment" (as the business journals call it) with the labor market stabilized at some five or six million unemployed—threatens the programs of farmers and city workers. Curtailed production and employment is welcomed by big business precisely because it holds out the hope of cheaper labor and cheaper raw materials.

Success on the part of labor in achieving its goal of steady and expanding full employment means a great deal to agriculture. It means high and steady farm income. It means a genuine opportunity to practice the conservation which the nation needs. It means an abundance of the goods that relieve toil. It means better farm homes, good rural schools, and hospitals and clinics that are accessible to farm families. It provides the only sensible hope in sight that we shall ever begin to do something for that suppressed one-fourth to one-third of families on farms who are truly the forgotten families of our day.

Labor's full-employment goal means the same things for all of us. It promises the only possible solution for the restrictive and separationist policies which plague all our groups. For if we go back to chronic unemployment we shall go back to prohibitive tariffs. And if we do not import, we shall not export. So again we will seek salvation through scarcity. Labor will join up with employers to restrict output, and agriculture once again, as in the '30's, will try to get ahead by attempting to make farmers imitate monopoly, and with as little success.

But labor will not achieve its goal unless farmers share in the winning of it. Nor will the two together make headway unless they and other groups of people get into politics. For the issue facing labor and agriculture is not merely what the welfare of the one means to the welfare of the other. The issue, I repeat, is whether the American people will create a grass-roots political democracy through which they can participate and plan together, can estab-

lish the goals which they desire to achieve, and can carry out through their governments such public policies as they find necessary. If they default, they leave the outcome to government by private monopoly or to a bureaucracy manipulated by the powerful few, and there will be little to choose between the two.

Are these conclusions too bold? In these days of corroding hysteria and of professional withdrawal, the attempt I have made to extract meanings from history and to create goals out of experience may strike you as neither safe nor persuasive. Well, in that event I ask you, who has, if labor does not, a program to make meaningful the future of our people?

MARKETING RESEARCH UNDER THE RESEARCH AND MARKETING ACT

BERNARD JOY

Agricultural Research Administration

WHILE conception took place with the passage and signing of the Research and Marketing Act on August 14, 1946, birth of the program did not occur until almost a year later, July 30, 1947, when funds to carry out the Act were made available. Although some plans for the baby were developed during the period of pregnancy, the record of progress began just two years ago.

Just as a parent can record the progress in height and weight of a two-year old child, so we can record the growth in the appropriation from the original \$9,000,000 to the present \$19,000,000.

On the other hand, just as it is difficult for a psychologist to appraise the mental and social growth and potentialities of a two-year old, so likewise is it difficult to appraise the social and economic significance of a program so young.

Those of us on the staff that has provided nursing services for the youngster are naturally proud of his progress. Our appraisal may not be as objective as it should be, because our relationship with the child involves the love that is a natural outcome of intimate association. In inviting me to speak on this topic you have exposed yourselves to the same danger as when you encourage a parent to talk about his child.

Those of us involved in the administration of the program are proud of its development. We believe that the person chiefly responsible was exceptionally well qualified for his task. E. A. Meyer had a clear vision of the potentialities of the program and a skilful hand in getting hundreds of people to assist in its development. His ability to obtain and amalgamate the constructive thinking of leaders among producers, processors, and handlers of agricultural products is a significant administrative achievement. The development of a program involving coordinated effort of personnel in several federal agencies, in the Land Grant Colleges and State Departments of Agriculture, and in private industry is not only an achievement of which each participant can be proud, but an administrative accomplishment that establishes Woody Meyer as a leader who deserves our highest tribute.

We likewise believe that we are most fortunate to have P. V. Cardon, the able and experienced Agricultural Research Administrator, as the person who will carry forward as leader of the developing program.

The situation on August 1, 1947, was not a simple one. The Act left a great deal of latitude with regard to (1) what was to be done, (2) who should do it, and (3) how it should be done.

What should be done?

Title I, Section 9 of the Act provided for allotment of at least 72 percent of the funds appropriated to the State Experiment Stations on a formula basis. It provided that up to 25 percent be allotted to the States for cooperative regional research. Except for the provision that at least 20 percent of such funds should be used for "marketing research projects" discretion regarding the use of these funds is limited only by the broad language "research into the laws and principles underlying the basic problems of agriculture in its broadest aspects."

Sections 10(a) and 10(b) provide for research in utilization and research in cooperation with the states in fields other than utilization. In other words, almost any type of research—new uses of farm products, nutrition, prevention of waste, animal and plant breeding, housing, soil and water conservation—all could qualify, and the list could be much longer.

Title II provides for research, educational, and service work in marketing. Marketing is a broad field encompassing preparation of the product on the farm, grading, packaging, processing, freezing, storage, transportation, wholesaling, retailing, consumer preferences, foreign trade, costs and margins, and pricing practices. This list, too, could be lengthened greatly.

Who should do it?

The Act provides for utilization of Federal agencies, State Experiment Stations, State Extension Services, State Departments of Agriculture and Bureaus of Markets, and private organizations. It specifies state matching of funds for certain work and permits contracts with public or private organizations when they can carry out work "more effectively, more rapidly, or at less cost than if performed by the Department of Agriculture."

How should it be done?

Developing organization, policies, procedures and staff is not simple when it involves agreements with a variety of Federal agencies, cooperative relationships with several agencies in each of 48 states, and contractual agreements with private agencies.

The Research and Marketing Act has at times been considered to be a Marketing Research Act. This is unfortunate, as legal provisions require that only about five percent of the funds be spent on marketing research projects, if utilization research is not classified as marketing research. Under Title I, Section 9, 80 percent can be spent on other fields. Title I, Section 10(a) funds are to be spent on utilization research, and Title I, Section 10(b) funds on research other than utilization. Title II funds could be spent wholly on marketing services and educational work. Of course, that was not the intent of the Congress, and a large part has been spent on marketing research.

The desirable flexibility in the Act did pose the administrative problem of deciding how much of the total funds appropriated should be spent on marketing research? How much on research in other than marketing? How much on service and educational work in marketing? The decision on these broad questions was not reached by one person or at one time. Fifty-one experiment station directors acting individually have had major responsibility for making the decision in regard to \$3,600,000 of the appropriation for the fiscal year 1950. A committee of nine experiment station directors had major responsibility for making this decision in regard to \$1,250,000. The results of their selection of projects is that approximately \$2,000,000 of Title I, Section 9 funds will be spent on marketing research projects in 1950 and this will be supplemented by about \$1,500,000 of state matching funds.

Some people classify all research in utilization of farm products as marketing research. Obviously development of new or improved uses does increase market outlets. However, almost all of this research is technological rather than economic. As it is covered by a separate section, 10(a), in the Research and Marketing Act, the amount is annually fixed by Congress. For the fiscal year 1950 it is \$5,000,000.

Title I, Section 10(b) is for cooperative research with State Experiment Stations in fields other than utilization. These funds can be used for marketing research and most of the Federal cooperation in conducting regional marketing research projects under

Section 9b3, has been financed from 10(b) funds. The amount in fiscal year 1950 for such cooperation is approximately \$350,000. As I expect the speakers that follow me to discuss the regional marketing research program, I will confine the remainder of my discussion to the marketing section of the Act known as Title II.

The appropriation for Title II for the fiscal year 1948 was \$2,000,000 instead of the \$2,500,000 authorized for the first year. In 1949 it was \$4,750,000 or 95 percent of the second year authorization. However, \$6,000,000 for 1950 for Title II is 120 percent of the second year authorization.

Title II funds are to be spent for marketing work. This can be either research or service and educational work. One of the difficult administrative decisions has been how to divide the funds between the three fields. It is complicated by the fact that insofar as possible the service and educational work in marketing is to be carried out through state agencies that must match Federal funds on a 50-50 basis.

The actual decision regarding the amount of funds going to State Departments of Agriculture and Bureaus of Markets for service work and to State Extension Services for educational work has been made largely in the states. To qualify for matching the state monies must be in addition to those available for marketing work when the Act was passed. The amounts of such new money that the States have had for marketing work has largely determined the amount of Title II funds used for educational and service work in the States. The Agricultural Research Policy Committee recommended that funds made available by the States be matched if their work proposals were sound and provided the amounts to individual states was not disproportionate to the total. With minor exceptions the amounts of money the states have had available have been matched and the portion of Title II funds going to them has approximated 20 percent of the total appropriation for Title II. In the fiscal year 1950 approximately \$1,200,000 of Title II funds and an equal amount of state matching funds will be expended on new service and educational work in the states.

Not all the remaining Title II funds are expended on marketing research as contrasted with marketing service work. Federal agencies may do service work and contracts may be executed with public or private agencies for service work. However, decisions in regard to such additional service work have been made on a project by project basis weighing the value of proposed service projects against

the value of proposed research projects. Some projects are difficult to classify as research or service, but based on a somewhat arbitrary classification the 1950 expenditure on Federal agency and contract projects for marketing service work will be approximately \$950,000.

The basic unit for consideration of what work should be done in the field of marketing research, how it should be done and by whom it should be done has been the work project. In 1950 there will be 95 marketing research work projects supported by Title II funds. The expenditure for them will be approximately \$3,850,000. The total Research and Marketing Act funds spent on marketing will be about \$6,200,000. With about \$1,800,000 of new state funds the total program is about \$8,000,000 greater in 1949-50 than in 1946-47.

Administration is sometimes divided into six major functions:

- (1) Developing policies
- (2) Developing plans of work and authorizing expenditures of funds to carry them out
- (3) Development of an organization and assignment of responsibilities
- (4) Selection, training, supervision, and control of personnel
- (5) Coordination of effort
- (6) Reporting accomplishment

A large portion of the administrative functions related to marketing research on Research and Marketing Act funds have been decentralized. Only functions 1, 2 and 5 have been the responsibility of the Administrator and his staff. They have worked on policy, plans of work, coordination, and budget justification.

The plans of work have all provided for the actual conduct of the research by agencies of the Department, State Experiment Stations and private research organizations. The administrator of the agency conducting the research has been responsible for the development of an organization, personnel and reporting the results of research work.

Two of the most important items of policy were indicated by the Congress in the Act itself. They are: (1) Use of facilities of existing agencies and organizations for the conduct of the work, and (2) Use of committees representing producers, industry, government and science to make recommendations relative to work to be done, and to assist in obtaining necessary cooperation to carry it out.

Plans of work have been developed within this framework. During the past two years final decision on what work is done and

what work is postponed has been made by the Administrator in conference with eight assistants. Before this group is a long list of work projects each with a price tag on it. The project titles are supported by a research outline which tells:

1. The problem and need for the work
2. The objective to be reached
3. How the work would be done
4. Who will do the work

Also before this group is the amount of money that is or may be available. This figure has always been far below the total of the price tags on the individual proposals. The problem is to reduce the list either by eliminating items or cutting the price tags until the total equals the money available.

When the group assembles it has some criteria in mind that are applied to each proposal. As these criteria have not been formally stated, I will express them in my own words.

1. Does the work qualify under the provisions of the Act?
2. Is the work part of a broad field that should receive emphasis?
3. How important is the problem to be solved in the minds of producers, industry and scientists as indicated by the priority given to it by advisory committees?
4. What is the probability of the proposed research being conducted successfully in light of the personnel and facilities available? Is the group proposing the work the one best qualified to do the job?
5. How does the particular research proposed fit together with work already completed or under way and with other work proposed?
6. Considering the first five criteria, how high is the cost in terms of probable results?

Many months of work have preceded the conference session at which some work projects are selected and others rejected. This work has consisted of delineation of the criteria and study of the individual work proposals.

The individual proposal has been checked against the provisions of the Act and the administrative policies set up pursuant to its provisions. Frankly one of the most perplexing questions is "What is marketing?" Text book definitions are of little help when you are faced with a proposal to reduce loss of a processed product during storage and develop methods for preventing the loss when the presumption that loss is caused by an organism that infected, but could not be detected in the raw product before it was harvested, is just as likely as the presumption that the loss is caused by conditions to which the product was exposed in processing, transportation or storage.

Determination of the broad fields that should receive emphasis is one of the major contributions of the 11-man Agricultural Research Policy Committee set up by Congress in Title III of the Act. This Committee meets quarterly. They point out the need for consideration of broad policies such as a desirable balance between livestock numbers and human population. Congressional hearings are also rich in indications of broad fields needing emphasis such as recurring questions on why the price spread between the farmer and the consumer is so great.

Establishment of the relative importance of various problems in particular fields has been the chief purpose of the meetings of 22 commodity and functional advisory committees. Before the committees meet a representative group of department scientists meet and develop a list of problems for the committee to consider. The advisory committee reviews the progress of work under way, adds problems to the list and arranges the list according to relative importance of problems.

The advisory committee recommendations are a major consideration in the selection of problems on which the agencies develop research proposals. However, the priorities suggested by the research agencies when they submit proposals may vary from those of the committees in light of the availability of personnel, facilities and "know how." Work basic to the solution of some problems may be barely started while the solution of other problems may involve the application of well-established techniques to an additional commodity or function. The plan of work and allocation of funds that has resulted from this process is summarized in the following table showing the budget for Title II funds under five major and 22 minor classifications

TITLE II. MARKETING RESEARCH AND SERVICES

	1948 Allotment	1949 Allotment	1950 Budgeted
I. Basic data and information			
a. Reports on supplies, prices and movement of farm products.	\$ 162,750	\$ 229,700	\$ 238,000
b. Improving market news and other market information services.	68,560	150,800	173,000
c. Promoting greater use of market information through State educational and service agencies.	16,000	156,000	175,000
Total, Financial Project I	\$ 242,310	\$ 536,500	\$ 586,000

TITLE II. MARKETING RESEARCH AND SERVICES (*Continued*)

	1948 Allotment	1949 Allotment	1950 Budgeted
II. Expansion of outlets for farm products			
a. Development of foreign outlets.	\$ 63,800	\$ 161,000	\$ 200,000
b. Exploring opportunities for expanding domestic markets.	38,840	158,700	193,000
c. Determining consumer preferences.	95,200	167,400	206,000
d. Consumer education.	48,000	86,000	125,000
e. State service programs to expand market outlets.	265,000	374,200	425,000
f. Analyses of supply, demand, and consumption.	69,350	139,100	149,000
Total, Financial Project II	\$ 575,190	\$ 1,086,400	\$ 1,298,000
III. Marketing services, costs and margins			
a. Analyses of marketing services.	\$ 24,200	\$ 70,900	\$ 149,000
b. Studies of pricing practices.	21,000	41,300	48,000
c. Measurement of costs and margins.	41,000	318,800	549,000
Total, Financial Project III	\$ 86,200	\$ 431,000	\$ 741,000
IV. Improvement in preparation and handling of farm products			
a. Development and improvement of grades and standards.	\$ 174,200	\$ 496,300	\$ 488,000
b. Developing improved containers and methods of packaging.	50,200	125,000	140,000
c. Improving transportation services and equipment.	14,250	51,700	120,000
d. Economic studies of new and improved processing methods.	58,650	140,000	255,000
e. Improved storage and conditioning of farm products.	95,900	322,800	422,000
f. Quality preservation in marketing channels.	64,500	271,600	255,000
Total, Financial Project IV	\$ 457,700	\$ 1,407,400	\$ 1,675,000
V. Evaluation and improvement of marketing system			
a. Improvement in physical plant.	\$ 160,800	\$ 252,600	\$ 268,000
b. Increasing efficiency of merchandising agricultural products.	106,800	246,200	315,000
c. Evaluation of market organization.	132,000	211,100	304,000
d. Improving marketing methods and efficiency through State educational and service programs.	166,000	443,000	675,000
Total, Financial Project V	\$ 565,000	\$ 1,152,900	\$ 1,562,000
Over-all Administration	73,000	135,800	138,000
TOTAL, TITLE II	\$2,000,000	\$4,750,000	\$6,000,000

ADMINISTERING MARKET RESEARCH—WESTERN PROBLEMS

D. B. DELOACH

Bureau of Agricultural Economics

VARIOUS comments have been made about the general conditions of western regional market research. Opulence, infancy, malnutrition, family troubles over finances, and cerebro-spinal ossification are attributed to the program. Obviously there are certain basic difficulties or your program committee would not have chosen to devote so much time to the subject of "Administering Market Research."

There are basic problems that have developed in the administration and activation of a large-scale regional market research program. They are centered mainly around specific points, namely:

1. The suitability and value of the market research projects regionally and to the state.
2. The inexperience of the existing market research staffs.
3. The feasibility of expanding the market research staff to handle projects of short duration.
4. The allocation of staff time between research and teaching.
5. The manner and extent of state participation in regional research programs.
6. The extent of industry and agriculture cooperation with regional market research agencies.
7. The lack of definiteness regarding the meaning of regional market research.
8. The time required to administer the program.

Suitability and Value

If viewed from the standpoint of research results only, the first two years of western regional research was almost a total loss. On the other hand, the eleven western states did effect a working mechanism through which regional research could be done provided the states develop their research staffs of trained people to carry through their assignments. This latter qualification raises several issues.

The practice of dividing funds among several states to do research on a specific problem implies an obligation to do productive research. This is true even though the funds made available to the station from state and RMA sources are barely enough to meet traveling expenses to the scheduled meetings of the technical com-

mittees. As a matter of good administration, states are going to be forced to ask what economic problems are of regional significance and lend themselves to active participation with several research agencies in the region.

I have had a reasonably close contact with developments in four WM projects. Experience and well defined regional research administrative procedures are lacking. Local pride and the fear of criticism for inattention to local problems make necessary the participation of each state in each of several projects. Frequently no results of consequence are obtained that would not have been obtained through non-participation. The added value of the research to the state is often slight. It is possible that some of this local emphasis will be relieved when regional research publications become better known.

Inexperience of Existing Market Research Staffs

Specific qualifications are necessary if a researcher is to accomplish worth-while results. Competence comes partly from training, partly from experience, and partly from an aptitude for the particular task. Some of the western states are still having a difficult time locating qualified researchers to fill existing vacancies, a condition arising partly from the lack of security of tenure. Others have filled all available positions but have had to choose men insufficiently trained and without any real interest or experience in marketing or markets. Under such conditions the administrator must have sufficient time to plan and to supervise the research program or the entire research operation is characterized by inefficiency and waste. There is reason to believe that most of our western stations have had to face this problem frequently. Inasmuch as experiment station market research administrators have had several new hurdles since 1946, their time must be spread thinly over each of many problems. In one sense, they have been forced until recently to accept the slogan of a prominent farm combine manufacturer, "Once Over and It's All Over."

Feasibility of Expanding the Research Staff

Good management practices in the field of economic research should follow good management practices generally, e.g., the size of labor force should be related to the volume of immediate and potential work. This type of managerial procedure presupposes

the existence of a market research program associated with the needs of industry and agriculture, but it in no sense excludes a core of basic research that might be called "tool building."

Several state agricultural experiment stations have expanded their market research staffs at a phenomenal rate since 1946. Part of this expansion has come as a result of a program begun under state appropriations for market research, but the real stimulus came from funds appropriated for section 9b3 of the RMA. Perhaps it will be shocking to some of you for me to state publicly that several western states and federal agencies (and I know of states in other sections of the country) have been embarrassed with too much money for market research, considering their plans and personnel. There are two reasons for this. The first is lack of time to develop a program and organize a competent research staff to carry through the program. The second comes from inability of research groups to obtain full cooperation from market agencies. Time is helping to correct the first condition because worth-while plans for research projects are emerging for 1950-51, along with better qualified and more seasoned research workers. The second condition is not improving. Marketing agencies are scrutinizing closely requests for confidential records, and are consistently raising the basic question regarding benefits to come from such research. Some business leaders who have been "surveyed" regularly without seeing any results ask frankly whether this is just another state or federal statistics-gathering scheme, the possible use of such statistics being only remotely associated with improving the efficiency of the market processes.

If any significance is to be attached to the foregoing conditions, one might assume that agricultural marketing agencies are much less interested in carrying on the type of regional market research done under RMA since 1947 than is commonly supposed. It is very easy for business people to point out the inconsistency of research designed to improve marketing efficiency while other state and federally supported programs are designed to maintain the status quo. All these factors taken together cause any good administrator to appraise the temporary and permanent personnel needs very carefully. If regional research is continued on the present scale, will the program be modified to require a "floating" group of regional researchers? If the program is not retained, do state civil service and retirement regulations make it inadvisable

to expand the research staffs? Each state must meet these issues in terms of its best judgment as to the basic market research needs of its people and the willingness of the people to finance adequately a worth-while program of market research.

Allocation of Staff Time Between Research and Teaching

There is no denying that western regional market research plans were badly disrupted for two years because the teaching load assigned to many research workers left little time for research. One glaring example is that of the researcher assigned to three research projects in addition to a teaching schedule requiring him to hold classes five days each week. This condition has not been corrected entirely. Conditions within the region are so much better now that harsh criticism for most of the eleven states is unwarranted. It will not be easy for some of the smaller states to completely solve this riddle of minimizing interference of teaching duties with research assignments. The nature of a teaching assignment is such that there is a minimum time requirement involved regardless of the quality of the work. The nature of man is such that there is a maximum time limit on the number of hours he can or will work each day. We have spent ten years in agricultural economics at Oregon State College trying to develop our research and teaching staff to the point where conflicts between the two assignments could be kept to a minimum. The results follow:

Number of staff	Assignment	
	Research	Teaching
	Percent	Percent
4	100	—
1	81	19
3	75	25
2	67	33
4	50	50
1	30	70

The foregoing allocation of time might not look good to other colleges, but it certainly is better than anything we have had previously. Furthermore, we have been able to arrange our teaching program in a manner to permit the teaching assignment to be completed before the research is undertaken. This is a very im-

portant consideration in a small school, because we have a limited number of graduate students to use on a market research program.

State Participation in Regional Market Research

It is difficult to establish any firm rule as to the number of regional market research projects in which a state should participate. The diversification and importance of agricultural activities and the characteristics of the problems should be the determinants. But they cannot be the sole determinants if efficiency is taken into consideration. For example, Oregon has such a wide diversification of crops and marketing problems that a selection based on the urgency of the problem has been the means by which most of our projects were begun. This basis for choosing fields of market research when funds are insufficient to go around may be lacking in many respects, but I cannot see any other practical procedure, all factors considered.

Certain of the eleven western states have established industry advisory committees to work with the stations in developing a market research program. Whether this device will prove satisfactory remains to be seen. The implications are quite clear; in fact, too clear to be entirely comforting to true research workers. It seems that the insistence of commodity groups that their particular problem deserves immediate attention has caused research administrators to divide funds among several projects to a point where no one project is adequately financed or staffed. The foregoing statement might appear inconsistent with my previous remark that research workers are not receiving the complete assistance of agricultural marketing agencies. This is not the case. When a commodity group advises that certain market research would be helpful and it would be interested in having it done with state or federal funds, there is no implication that the members of that industry are obligated to supply the information needed to make the inquiry successful. Some few months ago I sat through a meeting of one of the national commodity advisory groups. The commodity has been subsidized heavily for several years, yet there was very little interest in a study of the economics of marketing the commodity. There was no reluctance, however, to support heartily a proposal to use a substantial amount of research funds for buildings and physical equipment. One could easily raise the question at this point as to whether market research in state and federal agencies

can begin to rely more on good research procedure as a means of maintaining support.

There may be considerable disagreement as to the emphasis each of you will place on the conditions I have mentioned. Regardless of this, your decisions as to the number of research projects carried by your departments will have to be affected greatly by these forces.

Industry and Agriculture Cooperation with Research Agencies

Western regional market research workers have been very successful in obtaining cooperation from marketing agencies where the information needed related to handling practices and market channels. Reasonable success occurs in obtaining selling prices. The success curve starts downward rapidly when questions are asked concerning costs and the components of costs, and the location of market outlets. This type of questioning gets too closely to the only competitive aspect of many businesses. Cost information is also guarded closely by some types of businesses for fear it will be used to their disadvantage in wage negotiations with labor unions. In other instances the kind of cost data sought by researchers is not available and could not be made available without undue expense to the firm answering the questions.

A substantial part of the difficulty of obtaining factual data from marketing agencies stems from the inability of researchers to explain what they want, why they want it, and how such information will be used if it is made available. The inexperience of researchers in a particular field becomes an unusual liability in market research work. Too many researchers are interested solely in assembling a mass of statistics. Market men soon lose patience with a research man who is unable to ask intelligent questions about an industry on which he will later pass expert judgment. This situation has arisen so frequently that one wonders whether the training given students in agricultural economics is alone adequate preparation for market research.

Lack of Definiteness Regarding the Meaning of Regional Market Research

A cursory examination of the eight western regional market research projects leaves one with considerable doubt as to what constitutes regional research. I have tried to be broad-minded on

the subject. On several occasions, however, I have had to defend the actions of my fellow workers in Oregon and neighboring states. The fact that my arguments were accepted left me with the impression that the persons who accepted them were very generous in many instances. Two regional projects can be used to illustrate my point.

I believe the western dairy marketing project is a very good illustration of a regional research undertaking. As nearly as possible the principal states are working on different aspects of the problem of marketing milk. Some of the activities are confined to inquiries into local market problems, but in each instance, these problems are of significance far beyond the immediate area. To an administrator who is unfamiliar with the dairy industry, one has some difficulty explaining the regional aspects of the work in progress. On the other hand, the western group has had no difficulty explaining the regional characteristics of the turkey marketing studies which were brought to a close in June, 1949. The project looked perfect on paper, but in terms of the work done the regional features assume less importance than they should. I wish to add, however, that this very fact was one of the basic reasons for the development of a thoroughly coordinated program in marketing poultry and poultry products in the western region.

Time Required to Administer the Program

Considerable criticism has been directed toward the regional market research program because of the time required to plan and execute the work in cooperation with other states and federal agencies. There appears to be a reasonable justification for this complaint. Approximately 25 percent of the regional market research funds allocated to Oregon in 1948-49 was spent for administration as a result of direct participation in the work of the regional technical committees. If indirect administrative activities were charged against the projects in proportion to the actual time requirements, I do not believe I would be far afield to estimate the cost at approximately 50 percent of the RMA funds made available to Oregon for regional market research. My observation of the administrative activities of the Bureau of Agricultural Economics relating to the use of RMA 10b funds would indicate very heavy expenditures for administrative purposes. The Bureau's problem, like that of the states, arose from an attempt to spread its funds

thinly in all regional market research work. Conditions similar to those I have mentioned exist in a sufficient number of states to warrant a very close study of the basic causes and the possible implications of this situation.

Present Trends

Up to this point I have reported rather gloomily on the regional market research done in 1947 and 1948, recognizing a substantial improvement in the outlook for the current fiscal year. More improvement can be expected for 1950-51. Real progress has been made toward a definitely regional program for milk, poultry, and deciduous fruits. Further progress can be expected on other commodities if these initial steps are approved by the Committee of Nine. But in no case can the western region assume that it has solved its major problems until:

1. It has clarified and simplified the objectives of the regional market research program, and
2. Obtained from the Research and Marketing Administration and the Office of Experiment Stations a consistent, clear-cut, and simple set of administrative procedures that will reduce greatly the administrative confusion connected with the program.

ADMINISTERING MARKET RESEARCH— NORTHERN PROBLEMS

RAYMOND J. PENN
University of Wisconsin

YOU must recognize that my remarks on this subject will be based largely on a few months' experience in one agricultural economics department in one college of agriculture. When Mr. Wells asked me to prepare this paper he indicated an interest in the opinion of one "who has been more or less suddenly forced into the marketing field. . . ." This paper does not necessarily represent the policies of either the Wisconsin Experiment Station or the Agricultural Economics Department.

There is not much question what we are concerned about. It is the Research and Marketing Act of 1946 and the administrative problems growing out of a greatly expanded program of market research. I plan to confine this paper to those parts of the Act which are of most concern to an Agricultural Economics Department in a State Experiment Station.

Research funds may be made available to Experiment Stations under several sections of the Act. Stations may submit marketing projects under Title II, provided new money is available for matching purposes. Some Stations have Title II projects. However, I suspect our experience is rather common. When the Act was first passed our department developed quite a number of marketing research projects to be submitted under Title II. None of the projects were approved until the spring of 1949 when one small research project was activated. New money for matching purposes has been very limited in our Station. However, our 1949 Legislature appropriated some new funds for marketing. To date, then, we have made very limited use of Title II research funds. We may use it more in the future, particularly since a five-man committee of Station directors has been established through which Title II marketing research projects can be channeled.

Another source of research funds available to Experiment Stations is the allotment to U.S.D.A. The U.S.D.A. may contract to have research done by any public or private research agency (Sec. 10a of Title I and Title III). Our department has submitted one proposal of this type which has not as yet been approved. I under-

stand only a few of these contracts have been consummated with Experiment Stations.

My experience with Title II—the strictly marketing portion of the Research and Marketing Act—has been very limited and we have practically no experience with the contract arrangements. Hence, the remainder of my paper will be devoted to that portion of the Act which authorizes appropriations of research funds to the Experiment Stations, namely, Title I, Section 9. This section contains provisions for state research (Sec. 9b1 and 9b2) and regional research (Sec. 9b3).

State Research Under RMA

The funds allocated directly to the Experiment Stations may be used for almost any kind of agricultural research. However, at least 21 percent of these funds must be spent on marketing. The availability of the remaining 79 percent is contingent upon the full expenditure for marketing research. Research supported by 9b1 and 9b2 funds is done under very nearly the same administrative arrangements as have been used by the Stations for many years on all federal grant research. The essential difference is that RMA project proposals must be submitted six months to a year prior to the time when funds will be available for the research. According to a recent announcement from the Office of Experiment Stations all Sec. 9 projects for 1950-51 must be in the Office of Experiment Stations September 1, 1949. The projects will then be submitted to the Bureau of the Budget by September 15, 1949.¹ These proposals will be before Congress when the 1950-51 appropriation is made. It is my understanding that this makes it necessary for the Experiment Stations to use the 1950-51 appropriations only for the projects before Congress at the time of appropriation.

The Agricultural Economics Department at Wisconsin is participating in nine marketing research projects supported, in part, by 9b1 and 9b2 funds. Four of these projects are very similar to and support the regional projects of which I will have more to say later. I said we participated in nine marketing projects because two of them are being conducted in cooperation with our production departments.

¹ *Time Schedule for the Preparation of Cooperative Regional Projects and Budgets*, Office of Experiment Stations, May 5, 1949 (includes schedule for 9b1 and 9b2 projects).

These are some of the problems we face in using 9b1 and 9b2 funds, not necessarily in the order of importance.

1. If we do not utilize at least 21 percent of the 9b1 and 9b2 allotments for marketing the Station will lose funds available for non-marketing research. Obviously, we are under pressure to utilize the marketing funds. If we do not expand the marketing research in the agricultural economics departments we may expect to see an expansion of marketing research in the production departments. Of course, if we do develop a number of new marketing projects we increase our personnel and our space needs which brings criticism from our associates in other departments.

2. The time schedule for submitting RMA research projects does not fit my idea of the way research is done in social sciences. Particularly is this true if the Experiment Station Director cannot shift the funds from one project to another or change the projects. You will recall that the 1950-51 projects are to be in the Office of Experiment Stations, Washington, September 1, 1949. This means the research person must propose the project just about one year before the research begins. I recognize it may have been desirable to demonstrate to Congress the scope of the new research in order to receive the appropriations. The person doing the research, however, is often seriously handicapped if he is expected to work on projects drawn up a year before he starts his research.

A good research program, particularly one that is rapidly expanding, should permit the research person considerable flexibility. The social science researcher should have a plan of work which is in a process of continuous change. He tries an approach which may be fruitless and he should drop it. Or it may open up an entire area that was not before considered significant. For the most part, the usual Experiment Station procedure offers opportunity for flexibility. The director is close to the research staff and he knows the characteristics of most of the research personnel. I am confident many directors approve projects more on their confidence in a researcher's ability to do a good job than on what is said in a project proposal.

It is difficult if not impossible for the research person to prepare a meaningful project statement a year before the research starts. His attempts have resulted in much wasted effort. Most of us have prepared many more project statements for RMA than have been approved. I have had the feeling we were writing them in the dark.

We did not know the amount of appropriations which would be available and were writing projects for personnel not yet on the staff. Certainly staff working on a project should participate in the formulation of the research problems.

I think the time schedule for RMA projects should be re-examined. Why can't the 9b1 and 9b2 funds be allocated to the Experiment Stations each year as other federal research funds? We don't have to write projects a year in advance to use Hatch or Purnell Act funds.

We may well be at a point in our research where we will have to take a new look at just what a project statement is. I think administrators and researchers alike have placed too much reliance in the project statement. It is considered to be a device to control and direct research and at the same time to be a research plan of work. I am confident we would be more realistic if we would develop some sort of a research agreement which would be recognized as nothing more than an agreement to proceed on a general line of work. A series of work plans and summaries of results could be used to give the administrator whatever control is necessary.

3. A marketing research program called for by RMA requires personnel. Nearly all the Experiment Stations have or could make one or two positions available in marketing. Certainly we have done our share to raise the salary of marketing research personnel. I believe the best solution to the personnel problem is to bring more general agricultural economists and even economists into the marketing research program, particularly those trained in prices.

In our marketing research program we are helped a good deal by graduate students. Some of our more promising graduate students who have completed all requirements for their degrees, except the thesis, have been employed on full-time research for the duration of a specific marketing project. We have conducted several research projects in this manner which we think have made significant contributions both in research results and in better trained graduates. Some of these students could not have completed their graduate training without such an opportunity. We realize the fact that these young men do not have much tenure and that we are slowing down some the rate at which our graduates become available for permanent positions.

4. I suspect the most critical problem most of us face as a result of the RMA is that of defining significant and manageable research

problems in a line of work that is expanding so rapidly. The danger, of course, is that it is easiest to do more research on the same problems. We can always follow more agricultural products through the market and describe the functions, services, costs, margins, shrinkage, etc. I do not propose to set down a list of good and bad marketing projects. But I would be a little less concerned if more of our marketing research was designed to help improve our marketing system and more of our effort was directed at such areas as pricing arrangements, financing, and consumers' preferences.

The effectiveness of the research program of any organization will rest with the staff—not the administration. The marketing staff member who can locate real problems, get some information important to their solution, and see that results are made available to persons or groups who are making decisions, is indeed a valuable person. We must work out democratic procedures for administering research. Attempts in this direction are being made at a few colleges and universities and I know one or two men in the U.S.D.A. who understand the idea. However, the idea that administration can be democratic is completely foreign to most of our thinking.

5. The rapid expansion of marketing research in most of our departments has had no counterpart in the other lines of research we are engaged in. It is quite natural for administrators to think the agricultural economics departments are doing well, and, hence, to use the 9b1 and 9b2 non-marketing funds in other departments. I suspect some of the responsibility for this situation rests with the staff. Actually non-marketing research in agricultural economics is authorized with 9b1 and 2 funds. The non-marketing staff have not been familiar with the Act and hence have not submitted new projects in the time pattern required by RMA.

Regional Research (Title I, 9b3)

Anyone from the North Central Region writing on the RMA should have something to say on regional research. For over 10 years now the North Central Region has had at least two very active regional committees engaged in research activities—The North Central Regional Livestock Marketing Committee and the North Central Regional Land Tenure Committee. Both of these committees have received active support from BAE, U.S.D.A. The livestock marketing committee has had one BAE person available

to coordinate the research.² The land tenure committee has had a number of BAE personnel work with it on specific projects. And, of course, the Farm Foundation has given the tenure committee continuous support. The Farm Foundation was instrumental in arranging for the first exploratory regional conference at Davenport, Iowa in 1938. Since that time the Foundation has paid, among other things, the travel expense of state technicians to attend at least two regional meetings a year. Regional committees came along rapidly in the North Central Region. The Poultry and Egg Marketing Committee was formed in 1940 and the Farm Structures Committee in 1944. Now we have eight regional committees concerned with agricultural economics research, six in marketing.³ Experiment Stations in the north central region have published 14 regional bulletins, seven on land tenure, four on marketing, and three on farm structures. The success of the regional committees on livestock marketing and tenure in the North Central Region was one of the major reasons Congress included provisions for regional research by Experiment Stations in the RMA.

In spite of this background of experience, I think regional research is the part of the RMA most difficult for the Experiment Stations. Let me illustrate again with our department. Our department participates in seven regional projects supported by 9b3 funds. Six are marketing and one is soil conservation. Seven of our senior staff are members of regional committees. One is chairman of his committee and chairman of the executive committee. Two others are members of their executive committees, one as secretary. Four other senior staff members serve with the regional committees in one capacity or another. This is a total of 11 senior staff members. As a minimum a member of a regional committee should spend several days once or twice a year attending the meetings. I would think he should spend some time preparing for the meeting and some time after the meeting carrying forward the program and decisions of the committee. The executive committee, made up of three or four members, is usually given the assignment of developing the project, recommending budgets, coordinating the research,

² Bjorka, Knute, "Regional Research in Agricultural Marketing," *This JOURNAL*, February, 1945, pp. 121-137, Vol. XXVII, No. 1.

³ Cereal Marketing, Potato Marketing, Poultry and Egg Marketing, Livestock Marketing, Dairy Marketing, Fruit and Vegetable Marketing, Land Tenure, and Farm Management.

and editing the results. Major decisions are cleared with all state representatives. Members of these executive committees have quite a job. Decisions they must make are hard to make by correspondence. Hence, frequent out-of-state travel is necessary. Now for all six regional marketing projects our department will receive in 1949-50 about \$5,000 in 9b3 funds. This figure does not include regional funds (9b3) deposited with our Station for use of the regional "coordinators." You may say that it looks as though a small amount of regional money, acting as a catalyst, has stirred up a lot of activity at Wisconsin. The regional meetings have, I think, served as a stimulus to our research. On the other hand, most of the regional projects to date have not been enthusiastically supported by our staff if the amount of research done on the problem above the minimum regional requirements is an indication. I must say, however, that our department is planning to put about \$15,000 into research as a part of one regional project.

Although I am not familiar with the activities of our Station directors it seems to me they must be putting in relatively more time on regional research than on any other research program. One director is responsible for each regional committee and some directors have been assigned to several regional groups.⁴ The North Central Directors are meeting this week and I am told a considerable portion of their meeting will be devoted to regional research—projects, budgets, and allotments.

Regional research under the RMA has raised many of the same problems described in the previous section on state research (9b1 and 2). But, in addition, regional research has required relatively large amounts of time—both by staff members and administrators. Bookkeeping is excessive and project arrangements are complicated.

The real question before us is how to preserve the good features of regional research and at the same time reduce cost in personnel and money. We may find some of the RMA rules actually hinder work on regional problems.

I am in complete agreement with the logic behind the development of regional research in the RMA. The rules governing research workers in state Stations tended to limit their activities to the

⁴ *Definitions of terms and functions related to the organization and administration of Coop. Reg. projects . . . RMA.* Memo. prepared by "Committee of Nine," Office of Exp. Stations, U.S.D.A., Aug. 1948.

state. In many states technicians found it difficult if not impossible to travel outside the state. Many of the problems, particularly in social science, were common to several states and in some instances both research and improvement of the situation required the cooperative action of two or more states. Our North Central Regional Committee and subsequently regional research under the RMA were attempts to get research personnel from several states to work together on their common problems.

Generalizations are hard to make and often become meaningless. Yet here are some of the things I think Experiment Station personnel can accomplish by regional activity.

1. The competence of technicians will be improved. Technicians from several states working on similar problems will have an opportunity to exchange ideas and techniques.

2. Regional groups of technicians may bring valuable evidence to bear on regional problems without doing additional research. Previous research in the Stations can often be made the basis for important judgments on regional problems.

3. Regional groups can plan and conduct research together. I think there are three quite different types of research which can be carried on. One is in the nature of a regional census. This involves uniform schedules and the collection of similar data in each state. The second is a type of division of labor. Many problems are common to several states. If one state is doing research on one such problem then there is no need for additional work at another state. The third is research on a regional problem which will require regional judgment and regional action. This, I submit, should be the most important objective of regional research.

To date, however, very little of our regional research under the RMA has been directed to answering questions that must be answered as a region. There is some reason in this situation. A large segment of our devices available to do something about a given problem centers around our federal, state and local units of government.

I have described some of the regional activities we can and should carry on. Now let us return to the question of how to improve both the administration and the usefulness of regional research. As I have tried to point out the administrative machinery is costly in time and money. As yet the regional research has not been on regional problems, although there are some indications of

improvement. I am satisfied we should make some major changes in the rules. Here are my suggestions.

1. A series of regional agreements should be encouraged which spell out a general line of work. Funds should be allotted to these projects sufficient for the travel of technicians to regional conferences. This type of agreement should receive first priority in 9b3 allotments. The funds should be kept in a lump sum in the Station whose director is the advisor of the regional committee. This suggestion is based on my belief that most of the more desirable regional activities can be carried forward with existing sources of funds, provided rather regular regional meetings of technicians are possible.

2. If more specific plans of work are forthcoming for regional research 9b3 funds may be used in their support. These research plans should be carefully appraised to make sure the work cannot be done by other means. Certainly the plans should not have to be made a year before the research starts. There should be no attempt to use up a definite amount of money.

3. My third suggestion is that the full 25 percent of Sec. 9 funds need not be used for regional projects. If the research people do not develop enough regional research projects to use all of the funds the remainder will be distributed to the Experiment Stations under Section 9b1 and 9b2.

If we could follow the procedure I have suggested we would separate the funds used for the support of regional meetings of technicians and the funds used to do regional research. Combination of these two purposes has, I think, led to ill considered projects, especially where a definite fund has been set up and we try to use all of it.

DISCUSSION

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In my discussion of this topic I want to arrive at three major conclusions: (1) There is still a lot more to administering market research than is encompassed in various RMA funds and procedures (although properly the program committee and the participants have singled these out as the principal problems); (2) RMA funds are acceptable and can be utilized to advantage no matter what strings are attached; and (3) Committees are fine—in their place.

RMA sources of funds for marketing research were described by Dr. Joy. Leaving out the funds for utilization research, economists have a major interest in \$700,000 of 9b1 and 2 funds; \$371,050 of 9b3 funds, \$850,000 of 10b funds and \$3,800,000 of Title II funds. We are all glad to have these extra funds. Their proper utilization presents many challenges as has been pointed out.

We now have available in the Agricultural Experiment Stations a total of about 1.3 millions of dollars of relatively flexible funds as compared with slightly less than one million of 9b3, Title II and matching funds that might be classified as relatively inflexible in administrative procedures and use because of the unique problems associated with these fund sources.

Both of these sets of figures need some qualification—the flexible category by pointing out that considerable 9b1 and 2 and non-federal funds are tied up on regional or cooperative projects—and the inflexible by adding thereto some 10b funds allotted to cooperating federal agencies.

Nevertheless, at the moment, close to one-half of the total funds available for marketing research in Experiment Stations are relatively quite flexible. These funds constitute a very important segment of the total for good administration of marketing research.

While it is important that we continue to attempt to devise means of improving the administration of the various relatively inflexible RMA funds, practically we must realize that such funds are going to continue to be hedged in by restrictions and delays of one type or another. Let us then also adapt our marketing research programs to the funds available. This means, in general, (1) that we must look ahead at what the problems are likely to be three to six years hence and use inflexible funds for investigating these types of problems; (2) we must keep our flexible funds available for the "emergency" types of problems that arise; and (3) we should use a larger share of our inflexible RMA funds on "basic" research that will yield information that will be helpful for a wide variety of commodities, problems and circumstances.

Both Dr. DeLoach and Dr. Penn quite properly have given considerable attention to regional research. I am glad they have pointed out that some regional research was underway prior to the passage of the Research and Marketing Act and also that one of the principal contributions of the regional research procedure is to provide a means of bringing together technicians for a discussion of common problems.

I believe Dr. Penn should re-examine the regulations on 9b1 and 2 procedures. Titles and objectives, only, indicating the general nature of the work are required in advance by the Office of Experiment Stations at the request of the House committees on appropriations and agriculture. Similarly, the total 9b1 and 2 program, under present regulations, may be changed as much as 10 percent during the fiscal year for which funds are available. Projects under 9b1 and 2 funds that are not associated with regional or 10b cooperation rank next to regular federal grant funds and they in turn to state, receipts or gift and grant funds in administrative flexibility.

Barton De Loach emphasized lost motion in the west, but mentioned

that improvement is underway. May I agree on the lost motion, but emphasize the improvement? This has been stimulated by the Western Agricultural Economics Research Council both by discussion and by recommendations to the committees and to the regional directors.

It seems to me that this council, a sort of committee on committees for the western directors meets the qualifications of the proposal by Penn to finance such an endeavor out of 9b3 funds. The meetings are open and they are held either in conjunction with the Western Farm Economics Association or with technical committees.

Don't sell Title II short. Potentially it is a much larger source of marketing research funds than 9b3. At the moment procedures are not clear, it is difficult to determine what qualifies for support, matching funds are a problem, and "everybody in Washington, D.C. has to read and pass on every project proposed," but again improvement is in sight.

And, once more, do not neglect flexible funds. They are your ace in the hole.

The RMA by legislative direction and by administrative design has created and stimulated a rash of committees. Technical committees, councils, 22 industry advisory committees, policy committee, committee of 9 (8 old men and a nurse), ESMRAC. It's with committees as the entomologists say of bugs:

Big bugs have little bugs upon their backs to bite 'em
Little bugs have lesser bugs, and so on ad infinitum.

For the present let's classify them under only two headings—industry and professional.

First the industry committees. It's helpful to have them all meet at once. Spokesmen then work off a lot of their steam on each other.

By inviting industry groups to participate in research planning, and particularly if they get interested enough to put up some funds themselves, they become more interested in research. The big job in working with industry committees is to get their minds off their day-to-day problems and centered on a consideration of what will be useful five years hence. The wise research administrator will keep a little flexible fund sugar handy with which to be cooperative and handle some of the quickies. He will then encourage them to think long and hard about what are the basic, fundamental long-range problems.

Committees of professional workers have a real function in exchange of information; as a crucible for testing some untried or green ideas; as a means of bringing several specialized subject matter skills to bear on project planning; and as a means of raising the "norm" of research. Their big contribution is to be made in project planning—particularly what to undertake and how to start. From there on out our most valuable results will come from individual initiative and creative ability.

MAKING MARKETING RESEARCH USEFUL

F. L. THOMSEN

Production and Marketing Administration

IT WOULD be difficult to find a broader topic for discussion than the one assigned me for this round-table session. To make marketing research useful, it is necessary to (1) select significant marketing problems, (2) find solutions for them by applying adequate research methods, and (3) carry through with effective service and extension activities to insure practical application of the results. These three categories comprise just about everything in the administration and execution of marketing research, extension, and service programs. It is necessary, therefore, to limit my remarks to a few broad phases.

Right now about 50 percent of the consumer's dollar goes for production; 50 percent for marketing. If differences in efficiency of organization and management among individual marketing agencies are comparable with those among farmers, and if opportunities for technological improvement are as great, as I believe they are, we have no reason to anticipate a lower potential of improvement in marketing than in production. On the contrary, marketing offers the additional opportunity of improvement through changes in the *system* of marketing, as opposed to the efficiency of individual units, which is present in comparatively limited degree in agricultural production.

Some people say that the possibilities of improvement in marketing through research by public agencies are comparatively limited because the farmer has very little control over his products, once they leave the local shipping point. To me, this merely indicates the narrowness with which the scope of marketing research, service, and extension activities is viewed by many. The statement is valid only if we limit our research and other professional activities in marketing to those phases with which the farmer himself must deal. Actually, in order to encompass within our program the vast bulk of important marketing problems, we must be concerned with the marketing problems of marketing agencies far removed from the farmer. Our task in securing marketing improvement is largely that of effecting appropriate action by marketing agencies, not farmers. I believe that is possible, if we do effective research, extension, and service work directed at the operating problems of those agencies.

Some time ago, I addressed a few rather critical remarks in the JOURNAL of this Association toward what seemed to be rather obvious weaknesses in our agricultural marketing research. Along with some very nice bouquets, I received a few brickbats from colleagues whose sensitive skins apparently were allergic to frank criticism. To me, this is discouraging. Criticism, dissatisfaction with the status quo, a constant seeking for improvement, is the essence of science and of research. Are we to apply this searching analysis only to the marketing system, and not to our own policies and methods as researchers? Other sciences are constantly on the alert to improve methodology and results. Marketing researchers, if marketing research is to become really useful, must likewise be willing to put themselves under the microscope for periodic self appraisal and constructive criticism.

This is all the more important now that Congress has launched us upon a much more extensive and intensive program of marketing research, through the Research and Marketing Act of 1946. In my opinion, if this financial support is to be continued and expanded we must take the steps necessary to make our marketing research really useful, or the funds will be reduced or diverted to other subject matter fields where useful results are obtainable.

We have built up a considerable knowledge of what the marketing system is and how it operates. This knowledge, arising from a multitude of descriptive research projects dealing mostly with the comparatively unimportant aspects of marketing with which the farmer comes directly in contact, has prepared us to teach elementary courses in marketing and to counsel against wild-eyed marketing schemes that reflect a complete misunderstanding of actual market conditions. But it has not constituted a basis for important constructive improvements in marketing. We have built a foundation without continuing on to erect the house upon it. Yet we have been at this business for three decades or more, and can no longer cite the infancy of our science as an excuse.

I find, in discussing this subject with colleagues, a distinct tendency to confuse the "pure research" of the physical sciences with the sort of descriptive research we have been doing in marketing. It is pointed out that many of the most useful physical discoveries have resulted accidentally from research undertaken with no thought of useful application, or from later applied research based on the foundation laid by pure research. The atom bomb is a favorite example

offered in support of this thesis. Without granting that these instances are the rule rather than the exception, and calling attention to the relatively large volume of applied physical research which is directed at specific problems, I would remind you of some fundamental differences between the physical and economic sciences which relate directly to this problem.

In the physical world, conditions and relationships remain generally fixed. Once the properties of a given chemical substance are discovered, the description generally remains good for all time. Hydrogen sulphide smelled bad in my college chemical laboratory in 1915, and it smells just as bad now! No pure science researcher correctly described the physical properties of a group of chemicals as of 1939, only to find the same research organization starting to do the same job all over again in 1948 because the description was out of date. Pure or descriptive research in marketing is different in too many vital respects from the pure research of the physical sciences to warrant the comparison commonly made.

If I were to list a large number of practical, important marketing problems, the solution of which might contribute substantially to an increase in marketing efficiency or reduction of marketing costs, I am sure we would find that to many or most of them researchers have given little or no attention. This reflects a good many factors, including the preference for descriptive research projects, the frequent lack of adequate training which marketing researchers need to deal effectively with the more complicated marketing problems, and the tendency to select projects which are safe, noncontroversial, and give promise of assured "success." If a researcher sets up a project to study "Some Economic Aspects of the Marketing of Nebraska String Beans," unless he is an awful dope he is sure of producing a bulletin containing some interesting if useless "economic aspects." But if he undertakes, even in cooperation with other researchers, to investigate the possibilities of reducing fruit and vegetable marketing costs by integration of buying and bypassing several layers of produce dealers, he runs into some really difficult problems of economic theory and research methodology, not to mention public relations. He may or may not wind up with a nice bulletin which can be added to the list he prepared for his next job application!

Yet, if we would get somewhere in marketing research, we must courageously attack difficult and dangerous problems. Administra-

tive officials must be gradually conditioned to giving support to such efforts. Researchers must prepare themselves to deal with problems requiring a higher order of training and ability than the simple descriptive studies of the past. And we must seek the cooperation of Congress, advisory committees, marketing agencies and the public generally in support for this kind of marketing research. All of this will not come in a day. It will require patience, perseverance, aggressiveness, and competence, over a long period of years. But of one thing I am sure: we will never make real progress on a useful program of marketing research until we set our own sights high enough to encompass the marketing problems which offer potential opportunities for accomplishing something worth while.

I wish that the time allotted to me permitted a review of types of subject-matter problems in agricultural marketing, and the specific changes of direction in project selection, which would, I believe, put us on the road to realization of the great potential usefulness of marketing research.

The second prerequisite for useful marketing research, adequate research methods, is a subject, and a big one, all by itself. All I wish to point out here is that on this score, too, we agricultural marketing researchers are not nearly realizing our potentials. Our standards of professional training and competence in marketing research are, in my opinion, far below those found in the physical sciences. In commercial marketing research, which has been making great strides of late, professional standards seem to have been rising much faster than in agricultural marketing research.

The suddenly expanded marketing research program created the very real problem of obtaining professionally qualified personnel. This situation might be expected to become rectified in due course, were it not for the difficulty of weeding out the untrained workers, and the more important fact that our educational institutions are still turning out very inadequate numbers of men well trained in marketing and research methods. Among the scores of recent graduates, having various degrees from B.S. to Ph.D., whom I have interviewed in the past few years, few gave evidence of real familiarity with the more important tools of research. Many even displayed little or no familiarity with elementary concepts such as the elasticity of demand or the frequency distribution. Few of them had more than vague notions about sampling problems in marketing

research and how to deal with them. The term, "controlled experiment," seemed as foreign to them as the names of the Greek cabinet. How can we expect anything in the way of sound research from these half-trained people, who have been hurried through a few semester hours of economic principles, elementary marketing and statistics, the while they were "broadening" the smatter of their knowledge with courses in land tenure, labor problems, and the like?

Effective marketing research, dealing with difficult and intricate marketing problems, is no simple task to be handled by those with a smattering of training in marketing, economics, statistics, and research methods. To make marketing research useful, we must make marketing researchers competent. That calls for constant raising of standards, both in research institutions and training centers. Recently I was invited to appear as guest lecturer at a special session for marketing researchers. One of the first things my friend, the regular instructor, said was, "Now, don't make it too technical. Remember, these boys are from various agricultural colleges, and anything not pretty elementary will go right over their heads." That remark epitomized everything I have been trying to say here about training for effective marketing research; as did another recent remark by a man who was responsible for employing some marketing researchers for responsible positions: "The main thing is to see that they have a good farm background and a good personality. They'll pick up the research part as they go along!"

But the selection of appropriate projects and the competent application of research methods will not insure the usefulness of marketing research. In many cases, the value of the research will not be realized unless it is *persuaded* into use by appropriate informational, extension, and service activities.

On the surface, that may seem to be a very trite statement. The general idea has been stressed some thousands of times by extension workers, editors, and others. But I wonder if we have ever stopped to think about what it means in connection with "extending" the kind of useful marketing research I have been talking about?

Our whole information and extension program, and many of our marketing service programs, have been set up with farmers as the extendees. Yet, as I have tried to stress, improvements in market-

ing generally cannot be put into effect by *farmers*, but rather depend upon action by *marketers*. It would be almost as logical to carry the story of improved farm production methods to railroad workers as to attempt to effect most potential marketing improvements by educating farmers alone. If we are to make marketing research fully useful, some ways of extending it to marketing agencies and consumers, as well as to farmers, must be found.

By this I do not mean to imply that we should set up a whole new extension service to deal with people engaged in marketing in the same way that the present service deals with people engaged in farm production. I do maintain that the psychology, backgrounds, habits, and economic situations of marketers differ materially from those of farmers, and that we will not get far in extending the results of most marketing research by using personnel trained only in farming and agricultural extension methods, or by applying some of the extension devices which have been successful with farmers. We need an approach new in many respects, adapted to the job of training marketing agency personnel. Even if time permitted I could not suggest many features of such a modern marketing extension and service program. It is a really new subject, considered from this standpoint, and all that can be done here is to highlight the need, for the consideration of all of us who are interested in making marketing research more useful.

I hope this broad and generalized, and perhaps too pessimistic discussion of the subject is not a disappointment to those who came here expecting to be regaled with some specific examples of useful marketing research. I understand that some others on the round table will make good that deficiency in my remarks. Even though generalities are nearly as unpopular as criticism, I felt that I could make the best contribution to our round-table discussion today by iterating and reiterating what I believe to be some of the most important considerations governing the future usefulness of our expanding marketing research program.

EXTENSION'S ROLE IN GETTING RESULTS OF MARKETING RESEARCH TRANSLATED INTO ACTION

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HISTORICALLY, the Extension Service has always recognized its responsibility to farm people in the field of marketing education. This responsibility was pointed out in past basic legislation creating Extension work in agriculture and home economics. However, the passage of the Research and Marketing Act sharply focused this responsibility. The passage of this Act, it seems to me, should call for a revaluation and appraisal of Extension's activities in bringing the results of marketing research to bear upon our farm problems. In the past, Extension's efforts have largely centered upon marketing education at the farm and home and possibly with farm marketing organizations, especially cooperatives, at the local level. If the Extension Service is to shoulder the larger responsibility as outlined in the Research and Marketing Act, it will be necessary to enlarge both the areas in which we work and the clientele with whom we work. In our marketing educational work, we must not only make contributions toward the application of research at the farm and home, but we must go further and develop techniques and methods so that marketing research will be of benefit in areas beyond the local situation.

Research into the multitude of problems affecting marketing and consumer education was also given impetus by the passage of the Research and Marketing Act. How quickly the Extension Service can expand its marketing educational work will be determined in a large measure by how quickly the results of research become available and how rapidly Extension can expand its efforts in disseminating the research findings available.

Although we do not have the vast background of marketing research that is needed for many problems, there are sufficient data and experience through which to attack a few specific marketing problems. It is true that most of this data must find its application at the local level. However, this is not unfortunate in all respects. In order to implement an expanding program in marketing education, more personnel will in all probability be necessary. This personnel will probably come from new and young workers. They may

have had varying amounts of academic training in marketing, but they may have had little experience. Thus, as new workers gain confidence and experience in working with marketing problems at the local level, the worker can move on with experience and accomplishment behind him when more research in the larger areas becomes available. The application of marketing research, it seems to me, has special problems. Consequently, in order to maximize the usefulness of marketing research, it should be made available as soon as possible.

In order to picture more concretely how one Extension Service has approached the problem of taking the results of marketing research to the field, perhaps it would be well to outline the procedure taken in New Mexico. We based our program upon the needs of the people. It was felt that in this work, some indication from the rural people of New Mexico would be worthwhile in crystallizing our thinking on a problem approach to marketing. Our county agents were asked to determine as nearly as possible from planning groups and others what problems were of most concern to the rural people in their county. From these suggestions, some twenty major problems were determined.

These suggestions formed the basis for planning our marketing program as well as the entire Extension program. They were examined to determine, first, if we had enough research background in order to develop effectively an educational program and, secondly, if our resources, especially with respect to personnel, were adequate to apply effectively research findings to the problems submitted. As a result of the appraisal using these as criteria, some problems had to be deferred as needing more exploration while still others presented opportunities upon which we felt we could develop an objective marketing educational program.

After culling and selecting, project statements were written for eight projects. At the present time, we are actively carrying on work with only five projects. In drawing up these projects, experiment station personnel and, where appropriate and available, other groups and organizations were called upon to participate actively in planning. I might add, these same groups still are an important part of our marketing program. We call upon them from time to time in discussing the progress of the work and ask for their suggestions and recommendations.

In determining just which projects would receive attention first,

a priority was given to each project. Priorities were determined by how frequently reports from the counties indicated need and by our opinion as to our ability to do the work.

We believe that the marketing program is just a part of the overall Extension program. Such being the case, wherever possible, all members of the Extension staff make their contribution to the program. Subject matter specialists of the particular commodity under consideration are technical supervisors. The Extension Economist is charged with general supervision of the projects. The work done on marketing, whether it is our regular marketing program or work in connection with RMA projects, is centered around the county agent's office. We believe that he is the important cog in contributing toward effective marketing education and, that he is vital in expanding Extension opportunities in the marketing field. This means that we must develop programs which will give marketing training to agents and supply them with information which will assist them in the solution of local problems.

The marketing work we are doing for the most part has been localized but we feel that this work must be expanded to larger areas for maximum accomplishment. Those regions which are the most important from the standpoint of volume of production of the commodity concerned and where the problem is most pressing are receiving major attention at the present time. Our workers in marketing did not rush into the program, but they spent time in talking with producers, handlers and consumers. We felt that by getting well acquainted with the area, the people and its marketing institutions, we could be upon firmer footing. Because farmers and the trade have been contacted previously on the particular marketing problem involved, the acceptance of the Extension Service as an educational force in the marketing field was spontaneous for the most part. It seemed that both producers and the trade at the local level welcomed the opportunity for help.

In applying the results of marketing research, we are using the well established Extension methods. We have found these especially adapted in working with producers. We are stressing marketing educational work with our 4-H groups. It is our desire to develop within our farm youngsters an awareness of the marketing problems involved in agriculture and present to them at an early age such findings as are available. In order to work more effectively with trade groups, in some cases we have found it necessary to be more

specific in demonstrating Extension Service techniques of education. We have found it effective to work through not only producer organizations, but also civic organizations such as chambers of commerce, service clubs and the like which have a high percentage of businessmen. The continuation of their confidence in our ability to work in the field of marketing education will depend upon how effectively we do our job. We must take the research findings and apply them in an educational way so that they may find practical application in everyday buying and selling.

The inevitable question might now be asked just what progress our educational marketing program is making. In view of the fact that all educational processes involve time, we are reassured with the progress we have made. I shall comment only on those projects upon which we are doing intensive marketing work.

The project dealing with the certification and identification of our long staple cotton has received outstanding backing by trade sources and farmers. In 1948, of the approximately 380,000 bales of this long staple cotton produced in the area under this project, almost 90,000 bales of 1517 cotton were tagged. Only 25,000 bales were tagged in 1947. Although the 1948 figure represents a substantial increase, it is still insufficient to be of any great commercial value. During this time we naturally found some factors which we believe contributed to a lack of fuller participation on the part of growers in the identification program. We have changed our procedure in order to eliminate these. Reaction to this certification and identification program has been especially good from spinners.

In working with producers and milk handlers toward the quality improvement of milk and cream, we also have received good cooperation. Although statistics are not available at this time showing the improvement of the quality of these dairy products before and since the marketing project was begun, managers of all three of the major milk plants in the area have indicated that the quality is higher than in previous years. Local sanitarians and inspectors as well as the state dairy commissioner have indicated that the project is showing unusual results in bringing about a higher quality product. The number of cans of cream rejected is down, sediment tests are improved and bacteria counts are lower. Grade A milk quality has been improved but reports seem to indicate that the greatest improvement in quality has been made in Grade C milk. We feel encouraged at this statement from the dairying industry

since last year we shifted our emphasis toward working more with Grade C producers than Grade A.

Due to the relatively unfavorable reputation of eggs from New Mexico, we are carrying on a project dealing with marketing quality eggs and consumer education. We believe that at least a part of egg quality consciousness on the part of producers and handlers is a result of this work. Assistance has been given to plant managers in the handling and candling of their eggs and in their storage problems. Perhaps of greatest significance is our work with buyers in an educational program directed toward the use of grades as a basis for purchase. Just recently one city in the eastern part of the state has begun a program to buy on grade. Grocery stores who purchase eggs from farmers are also buying on grade. In carrying on educational work with the consumers, we have been surprised at the large number of inquiries for information and requests for demonstrations on the various grades of eggs and their uses.

Our project on wool has met with enthusiasm on the part of producers but has not received the same response from the wool buyers. Upon initiation of our wool program, an attempt was made to skirt the wool. Working with the New Mexico Experiment Station in the spring of 1948 under the existing market conditions, fleece skirting did not seem advisable. Therefore, fleece grading at the ranch was emphasized. Grading of the wool at the shearing shed, we feel, has proven to be less time consuming and easier than at some point after the wool is sacked. Over 300,000 pounds of wool has been handled on a demonstrational basis since this program started. Since the grading of fleeces at the ranch is a new concept for New Mexico ranchers, we are devoting increased attention toward training county agents in this procedure.

A new project deals with the rating of rams. This is another new concept whereby ranchers may buy good sires sight unseen. We hope by the system of ram certification that a pool of desirable individuals might be obtainable in the state which will increase the return of clean wool per fleece. Already 155 rams have been certified as to clean wool production, type of body, staple and length of wool, degree of body wrinkles, and amount of face covering. Standards have been set up for all of these factors and grading and certification has been done accordingly. Interest in this program has already been manifested by buyers who need rams for use in their herds.

The newest project which we are just initiating is in the field of consumer education. We will direct practically all of our efforts toward working with urban groups. Best buys, selection and care of fresh produce, nutritional benefits of various foods and information on the food situation will receive major emphasis in this marketing work.

These are just a few highlights of our marketing projects and some indication of the progress we are making and the approaches we are taking. We feel that we are making progress but recognize that we are a long way from our complete objectives.

In conclusion, I would like to point out a few things, which in my opinion, will be necessary if both research and education in marketing are to show maximum accomplishment. First, I think it is extremely important that research and Extension personnel should work together as never before. Research and Extension should maintain a continuous two-way exchange of ideas. This would mean that Extension could keep research informed of changing conditions and new problems and research could furnish new findings for Extension to use in the field.

Research is needed by Extension at the local level. Also, in order to expand our marketing program to new areas and new clientele, we need research on national and regional problems. This would require an over-all approach to marketing without regard to political boundaries.

Extension, too, must find ways to attack regional marketing problems as research becomes available. State Extension Services must find means to bridge the gap that has for the most part restricted their activities to problems within their own state.

Extension must get new workers trained in marketing and enlarge the experience and training of present staffs. County agents, as mentioned previously, must be a part of this program and in many cases they must be trained.

Extension must expand its activities in working with the trade and consumer in this marketing work.

To broaden our marketing program presents a challenge and a responsibility. Without research, Extension marketing work will be ineffective; without Extension carrying the results of research to the field, much of the timeliness will be lost and effective application will be minimized.

EXTENSION'S ROLE IN GETTING RESULTS OF MARKETING RESEARCH TRANSLATED INTO ACTION

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IN THE last few years we have been making considerable progress, largely as a result of increased funds made available by the Research and Marketing Act. The results of many new research studies are becoming available. Extension has increased its marketing force and is now engaged in translating these and other research findings into action. But we often feel impelled to repeat the last words of Cecil Rhodes, the great British-South African statesman, "So much to do; so little done."

The question before us is—How can Extension do a more effective job of getting research information used?

A close working relationship between Extension and research personnel is highly important. Extension men with their contacts in the field often are able to advise concerning research work that needs to be done. The research men can keep Extension informed about the progress of studies that are under way.

In many institutions, an Extension man serves on the advisory committee of each research project. It is also a common practice to hold periodic meetings of the two groups to exchange information on research findings and Extension teachings. County agents are brought into these joint conferences occasionally to present the viewpoint of those who are more closely associated with farmers.

Research personnel should be used when feasible in some Extension work. In this way they can learn what farmers and others engaged in marketing are thinking and what their needs appear to be. These contacts should help keep research on a more practical basis. Undoubtedly, there are many research studies that have been undertaken with little thought given to what use would be made of the results.

Marketing Specialists Need More Training

Many of our marketing Extension specialists are inadequately trained to do what is expected of them. Usually they have a working knowledge of statistics, accounting, agricultural prices and economics, but this is not enough. They need to know in addition

a great deal about the commodity with which they are working. There no doubt are some who would disagree with this statement, but there are many marketing economists who list this as one of their most serious weaknesses. One extension economist in the East who was turned into an egg marketing specialist was heard to remark "I was an Extension economist, but I am now a specialist in egg marketing and I don't know a thing about eggs nor how they are handled." His solution was a short leave of absence during which he worked with the egg trade.

Moreover, it is my observation that the best marketing work is done by those who specialize along commodity lines. The problems of milk marketing are vastly different from those encountered in the marketing of grain or wool. It is physically impossible for most men to be well informed about the peculiar marketing problems of many different agricultural commodities.

Marketing specialists sometimes fail because they try to do the job alone. Why not make marketing a project in which all extension personnel can play a part? Is it not true that marketing begins with production and ends with consumption?

The dairy specialist, the agronomist, and the farm management man as well as the milk marketing specialist are involved in the problem of how to get more fall milk in order to meet consumer needs during the months of low milk production. This is more than a job for the marketing specialist. Certainly feeding, breeding, management, pasture treatment and cost analysis have parts to play in this effort to smooth out the seasonal maladjustments in milk production to meet the needs of the market.

The marketing of potatoes begins with the production of the best varieties for the market and extends through proper care in digging to good grading and packaging and on through to distribution and food preparation. Here the plant breeder, the agricultural engineer, the marketing specialist, the nutritionist and many others are needed to produce and sell a good marketable grade of potatoes at a profit.

We Must Work with Individuals and Organizations

Sometime Extension fails to translate research results into action because too much time is spent in preparing reports, writing news articles and giving speeches and too little time is spent in working with those who have a marketing job to do. Extension

men must have contacts with farmers, consumers, cooperatives, wholesalers, jobbers, chain stores and others in the trade and *work with them*. We don't operate in a vacuum. Our information is only helpful in so far as we can get individuals to use it.

At the Regional Extension Marketing Workshop which was held at Pennsylvania State College in the spring of 1948, the marketing people in the Land Grant colleges were criticized—both research and Extension—for spending too much time at the farm level and too little in dealing with a solution of those marketing problems which arise in processing and distribution.

In an address entitled "Broadening the Field of Extension in Marketing Work," Edwin W. Stillwell, Vice President of the Farm Market Relations, Inc., said at this workshop:

"For many years experiment stations and the Extension Service concerned themselves only with problems relating to production. The development of Outlook reports expanded the horizon somewhat. Here and there real progress has been made in dealing with specific and real marketing problems. By and large, however, these organizations and the Department of Agriculture itself have worked with a "Chinese wall" which was erected at the wholesale level. Little consideration has been given to the problems occasioned by the movement of agricultural products to and through the retail store and into the paper bag—the last stage in the sale of the product to the ultimate consumer. . . . If the Extension Service really is to broaden its field in marketing, it is going to have to pierce or knock down this "Chinese wall." It is going to have to extend its teaching into the problems faced by the retailer and to consider the wishes and foibles and changing habits of the consumer. This is true because the consumer making his or her selection from among nearly 2,000 items in a modern grocery store is the one who determines finally whether the production of a commodity will be profitable or otherwise."

If we are to meet this challenge, we must move on into these comparatively unworked fields.

The marketing of farm products does not stop at the farm nor does it stop at state lines. Many times, the state marketing specialists have been handicapped in their efforts to follow commodities through to markets because these products move out of the state. Travel funds for out-of-state work usually have been drastically limited. The Research and Marketing Act with its provisions for regional work should prove of inestimable value to those who have an interest in working with people who are engaged in transportation, processing and distribution.

In late years, we have been entering vigorously into the con-

sumer education field. To be most useful here, we should not limit our activities to information on supplies, prices and consumer use. We need also to stress the costs of various marketing services and help consumers to decide how much service they want to pay for. It might also help consumers if they knew why they have to pay 21 cents for a quart of milk and 71 cents for a pound of butter.

Many times our Extension people limit their usefulness by assuming that the entire marketing field is theirs. Whether we like it or not, we must be ever mindful of the fact that there are many other agencies and groups carrying on educational work in marketing besides Extension. A good Extension marketing program is one that tries to secure the cooperation of these other people in carrying out a broad action marketing program that will be beneficial to all.

Another question that keeps being asked in our discussions relative to the proper use of research information is: How can we get the results before the information is too old to use? Research is a slow process and sometimes a long period of time elapses before the information is ready for publication. Would it be possible to make more use of preliminary results? Can Extension surveys supplement the more comprehensive studies of the research men?

So far in this paper we have been discussing the ways in which Extension can secure better results in the marketing field. In dealing with the problem at the farm level, there no doubt is a place for agricultural outlook and farm management information. With farmers, it's more than how to sell; it's also when to sell and what to sell. A knowledge of price trends, costs, seasonal influences, market preferences, consumer demand and governmental policy are all necessary if the farmer is to make wise marketing decisions. For many years, the Extension people at Penn State College have been combining marketing, agricultural outlook and farm management in one discussion. When this type of meeting is built around a commodity, it is very effective.

We Must Improve Our Methods of Extension Teaching

It is difficult for us to admit that our work in marketing is not reaching as many people as we had hoped. Can it be that we lack luster and appeal in our techniques?

Let's see how others attract the crowds and obtain a following.

Prizes, contests, acrobatics, dramatic skits, sound movies, glamour and human interest are all used to get people to come out to meetings and to hold their attention while they are there. Billboards, multi-colored posters, radio commercials, cartoons, attention-getting exhibits and advertisements well illustrated by highly paid skilled artists command the attention of the average American at every hour of his daily and nightly rounds.

Can we compete with these attractions and still tell our story in such a way that people will come to our meetings and read our marketing information? It is possible, but we must change our techniques to fit the times. We must use all media that are available for Extension teaching. Among these are slides, posters, exhibits, dramatic skits, sound movies, radio, television, news articles, envelope stuffers, well-illustrated talks, round table discussions, marketing tours and industry-wide conferences.

We'll have to improve our writing. Too much of our material is stilted and difficult to read. We write for the high school or college graduate and most of our reading public has never seen the inside of a high school class room.

We must make it easy for people to become better informed about their marketing problems. If we fail in this, many of the people who most need our help will never be reached and much valuable new research information will not be used to the best advantage.

Everybody from the farmer to the consumer gets very much interested in improving marketing methods and cutting distribution costs when prices start to sag and marketing costs remain high. We are indeed fortunate that we can go into this period of declining farm incomes and reduced business activity with a wealth of new market information. The question now is: How can we get enough men to do the big job that lies ahead? Frankly, there are not enough trained marketing people in the country to perform this task. We must train county agents, cooperative field men and directors, service men of private organizations, Vocational Agricultural teachers and local leaders to take a hand. Not all of these people can be used for all phases of marketing work as some of the problems are exceedingly complex and ever-changing, but we'll get nowhere by shrugging our shoulders and saying we cannot use them. The job is too big for the trained Extension specialists to do alone.

Let's Take the Test

Now that we have discussed ways and means of making our work more effective, might it not be worth while to take a look at how we apply these principles in our extension work in Pennsylvania? We are not able to measure up on all points, but let's make the application to a sample of our work and see how it fits. You can do the same in your state.

Let's take milk marketing for an example.

For each of the research projects in milk marketing, the milk marketing specialist is on the advisory committee. The research men are used in the field occasionally, but probably not enough.

One specialist devotes his time spent in marketing to milk, livestock and poultry. This is not the degree of specialization that will bring the best results, but it is better than trying to cover the field in a state with a great diversification of farming.

Our milk marketing specialist took a leave of absence one summer to work with a milk cooperative to increase his knowledge of the product.

We try to interest a number of people in milk marketing. The agronomist helps us in our program to get more fall milk by giving farmers information on improved and supplemental pastures. The dairy specialists in artificial breeding and DHIA work show dairy-men how to breed in order to reduce the big seasonal fluctuations in milk. The dairy manufacturing specialist assists us in appraising milk plants and in setting up new plants. The nutrition specialists stress the use of milk in the diet and emphasize ways in which the consumer can use more dairy products during the flush season of production.

We work with individual farmers, cooperatives, milk dealers and federal and state milk control officials. We have no contact with consumers except through the press and radio.

Serious limitations on out-of-state travel preclude our following the milk produced in Pennsylvania to the New York market. Consequently, we know less about the New York market than we should and we are not always able to give our farmers shipping milk to New York the help they have a right to expect.

We have never been too aggressive in Pennsylvania in mapping out a marketing program and taking it to the people. Rather we have waited, and probably too often, for others to take the initia-

tive and then to request our services. This policy has resulted in some milk marketing work being done where we have not been called in. In one case there is a fight on between two farm organizations and probably we are fortunate in not being in the middle. And again if we were called in, we might be able to pour some oil on the troubled waters.

We make liberal use of preliminary research findings and extension surveys. This keeps us up to date on our information.

As has been stated before, we tie marketing, farm management and outlook information into one package and apply it to a commodity. This approach has been used in our milk marketing work to good advantage.

In the training of others to help do the work in milk marketing, we weigh ourselves in the balance and find ourselves wanting. True, we have a number of county agents in our dairy counties that do a very creditable job of milk marketing, but we have many others that take little active interest. The field men and directors of our milk marketing cooperatives and the field men of our milk companies have obtained some information from us, but they get much more from their organizations. The training of local leaders in milk marketing work has never been tackled. We feel that this field is too complicated and changes too often for us to make much use of local leaders in furthering our milk marketing program.

Marketing work is being expanded very rapidly and encouraging progress has been made, but we are only beginning to solve some of the many problems that incessantly arise to plague us. We now have a golden opportunity to produce. If we fail it will be a long time before we get another chance. It is as Milton said in *Paradise Lost*, "Awake, Arise or be Forever Fallen."

METHODS EMPLOYED IN AN ANALYSIS OF THE SPREAD BETWEEN FARM AND CONSUMER MILK PRICES IN NEW YORK CITY

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IN MARCH, 1949, the New York State Temporary Commission on Agriculture released a report, "An Analysis of the Spread between Farm and Consumer Milk Prices in New York City under Present Practices." In this paper, which is based on the report, we propose to discuss the methods and special techniques which were employed in the study rather than the results.

Before proceeding further, however, it will be well to describe briefly the New York milk market and state the objectives of the study, since these considerations were responsible for the methods of study finally adopted.

Milk for distribution in the Metropolitan Area was received through 433 approved country receiving stations of which 343 were located in New York State. Eighty-one different companies or groups of associated and subsidiary companies shared the ownership of these 343 country plants. There were 21 fully integrated companies, i.e. with country plants, city pasteurizers, and routes. In 1947, 72 percent of the country plants included in the New York pool limited their operation to receiving, weighing, testing, cooling and trans-shipping milk.

Pasteurizing, Processing and Bottling in New York City

Except for a very small quantity of special milk, all milk and much of the cream distributed in New York City is pasteurized and packaged in approved plants in the marketing area.

There is little difference in the functions performed in these various classes of plants. The following classification is useful principally for purposes of describing the nature of the companies engaged in the business.

(a) *Plants operated by integrated companies which do little or no processing for others.* A large portion of the milk business is included in this classification. Most of the large companies in the group are self-contained. Included in this group are a number of smaller companies with wholesale outlets only. Frequently, they are somewhat specialized in their sales.

(b) *Plants operated by integrated companies which do a substantial business in processing and bottling for other dealers.* In general, companies in this class are (1) fairly large; (2) have a country supply of milk in excess of their own requirements; (3) offer a wide range of products and services; (4) have a wholesale business of their own but no retail routes.

(c) *Plants operated by companies with city routes but without a country supply of their own.* Companies operating plants of this type are generally smaller than average. Their supply of milk is furnished by other dealers or purchased from independent proprietary companies operating country plants or from cooperatives. Frequently, arrangements for the milk supply are negotiated through milk brokers.

Distribution of Milk and Cream in New York City

New York City's milk and cream is distributed to homes through 2174 retail routes and to stores, hotels, restaurants, and other wholesale outlets through 1626 wholesale routes. Most of the retail routes have A and B sections as a result of the introduction of every-other-day delivery in 1942.

In order to service areas distant from the plant and to avoid congestion in loading at the plant, depots are used in certain instances. With the advent of motor truck delivery there has been considerable decrease in the practice of using depots. Nevertheless, 39 percent of the retail routes of multiroute companies and 83 percent of the retail peddler routes originated at depots. Only 11 percent of the wholesale routes originated at depots. Depots are of three general types.

(a) *Depots of integrated companies serviced by the companies' own processing plants.* Packaged milk is loaded into vans and hauled to the depot, which consists of an ice box, office, and garage. The milk is loaded on to route trucks directly from the vans. It is distributed and accounted for in a manner similar to that employed when routes originate at the plant.

Each point of distribution, whether at a depot or plant, may have some depot functions. For example, a company with several processing plants may elect to produce a certain item at one plant only. This product then would be distributed through all branches, including those at other plants. Similarly, companies distributing from their own plant only and without outlying depots, may dis-

tribute items not produced in its own plant but purchased and delivered to it by another dealer.

(b) *Depots operated by companies without processing facilities of their own.* Most common is the depot operated by a small wholesale company which distributes a finished package of products purchased from or processed by one or more other dealers. The route trucks are loaded with all or the major part of their loads at the loading platform of the supplying company. Minor items are loaded from the ice box at the company's own depot.

(c) *Depots operated by peddler supply companies.* There were in 1948, 349 retail peddler routes in operation in the five boroughs of New York City. Usually the peddler supply company buys a finished package of milk or products from a company with pasteurizing and bottling facilities. This milk is van-loaded to the depot of the peddler supply company where it is reloaded directly from the vans onto the retail route trucks of the peddlers. The peddler supply company furnishes ice box and office facilities, bottles, caps and cases, and takes care of route returns. It maintains its brand name, exercises certain control over quality, advertises the brand, and provides a general supervisory function for the peddlers essentially similar to that provided in depots of fully integrated companies.

Of the milk which finally reached the consumer in homes in New York City, 28 percent was on home delivery and 72 percent was through stores in 1948.

The average prices paid by consumers for milk varied from a low of 20.6 cents per quart of plain milk for non-advertised brands in stores to a high of 24.9 cents per quart for advertised brands of homogenized milk at home delivery. The principal variables are: (1) advertised brands and other brands; (2) plain milk and homogenized vitamin D milk; (3) glass bottles and paper containers; (4) one-quart and two-quart containers; and (5) retail sales through home delivery and through stores.

The difference between average home delivery prices of peddlers and of advertised brands was determined to be 1.8 cents for approved plain milk in glass quarts and 2.0 cents for homogenized Vitamin D milk in glass quarts.

There was little variation in the resale price of advertised brands, but independent distributors were likely to give price concessions

to consumers or merchants who took a large number of units per stop.

At retail, two large companies had most of the business. This milk sold at a premium over unadvertised brands. The remainder of the retail business was split among four smaller fully integrated companies, 27 small retail distributors, and 349 peddlers.

At wholesale, more uniform conditions prevailed, although the advertised brands of milk moved into stores at a premium price over unadvertised brands. In the wholesale business, four large companies had about 45 percent of the business. Twenty-eight smaller companies with their own pasteurizing and bottling facilities had about 45 percent of the business and 43 small companies without pasteurizers had 10 percent of the business.

This study of the "spread" in milk prices between the farmer-producer and the New York City consumer was undertaken to determine the costs borne and the profits earned by the various agencies engaged in getting milk from the farmer's platform to the consumer. It also was the expectation that facts would be discovered which would make it possible to effect economies in this process.

A brief review of the data just reported will suggest that ordinary statistical treatment will not serve. In the search for a method of study which would reveal the true facts with respect to costs and permit realistic and profitable comparisons, a determination was reached to make the analysis on a functional basis.

There are clearly defined jobs (functions) that must be performed in getting milk from New York State farmers to New York City consumers. Each of these functions must be performed in a similar manner whether by a fully integrated company, which performs all the functions, or by an independent proprietorship or cooperative, which may perform only one.

For each function a carefully selected sample was obtained so as to reflect: (1) size and location; (2) ownership; and (3) type of operation.

Functions Included in the Study

1. Country Hauling—the average cost of custom hauling was used.
2. Pool Service—actual assessments by the Market Administrator and actual payments to cooperatives were used.

3. Country Receiving and Shipping—detailed time and cost studies were made.
4. Transportation from country plants to city pasteurizers—actual costs were determined from companies' books.
5. Pasteurizing, Processing and Bottling—detailed time and cost studies were made.
6. Platform and Loading—detailed time and cost studies were made.
7. Depots—detailed time and cost studies were made.
8. Retail and Wholesale Distribution—detailed time and cost studies were made.
9. Distribution through Stores—a detailed study of stores was made to determine buying and selling prices for milk, mark-up of comparable items, volume of milk handled, and kind and amount of services performed.

Each of these functional cost studies was made in a manner to reveal:

1. Dollar costs for the latest 12-month period available at the time of study for each company.
2. Unit cost in hours of labor and quantities of materials, supplies, and services.
3. Median costs and range in costs among those performing the functions.
4. An explanation of differences in costs among those performing the functions.

Costs were allocated within the function according to uniform procedure. This was done by a careful analysis of money costs as reported on the company's books. Costs were determined and allocated to functions and to products on a basis of engineering studies of time, space, power, materials, and service utilization. For each function, costs were determined for each separate process. Product costs were determined for each identifiable product.

A preliminary field review of both the books of account and the methods of operations in country plants indicated that these costs could be expected to vary according to the following factors:

1. The volume of milk being handled in each plant.
2. The number of cans of milk per producer.
3. The age of the plant and its equipment.
4. Administrative overhead.

A stratified sample was selected on the basis of these factors which were expected to influence costs. The operations were time studied and the labor and expenses for a twelve-month period were summarized. The results of these calculations showed country plant

costs ranging from a low of .350 cents per quart to a high of .589 cents per quart. This beginning difference in spread required for country plants is equal to the profits claimed by milk companies in their public statements.

City processing plants are highly mechanized in their pasteurizing and bottling procedures. Health department regulations establish a high standard for the cleanliness required for all operations. Total city plant labor and expenses, however, were found to vary by as much as one and a half cents per quart. Varying pasteurizing techniques, different bottling speeds, different degrees of labor utilization, and varying practices for loading and checking the trucks were found to be criteria for cost differences which again were used as the basis for selecting the stratified sample to be included in the survey.

Truck distribution to private homes, to stores, and to restaurants creates more cost per quart than any of the other functions between the farm and the consumer.

Detailed time studies of several thousand home delivery calls showed significant differences between the costs incurred in delivering to various kinds of customers. Consumers living in fifth floor walk-up apartments and receiving only two units with each delivery call and requiring weekly cash collections by the driver create obviously greater costs than consumers living in row houses taking four quarts with each delivery and paying their milk bill by check once a month. Any audit pooling of these varying conditions into an average cost per quart obviously obscures many of the causes for high costs of distribution.

A basic difference in procedure was also recognized. Some companies spend as much as \$7.67 per route day for selling and administration functions on their routes. Other routes are operated by individual entrepreneurs who own their own trucks and whose expense for selling and administrative functions can be evaluated as low as \$.94 a day. The economic justification for selling and administrative expenses in the amount of \$7.67 was brought under scrutiny because routes so administered served only 135 customers a day with an average of 2.86 units per delivery. The individual entrepreneur, however, who combined selling and administration with the physical work of milk delivery served 177 customers per day with an average of 2.83 packages. The differences in consumer buying habits and company operations combined made a difference

per quart of almost 3 cents in the cost of distributing milk to homes.

This functional analysis of home delivery also clearly indicates that home delivery costs are created as a given amount per customer call rather than as a given amount per quart. No significant cost difference could be found between serving a four-quart customer and a one-quart customer.

Store distribution costs were found to require similar detailed time study and cost observations. Some food vendors require daily cash collections by the driver as well as extensive in-store services, such as arranging the milk in the ice box and accounting for returned deposit bottles. Other store-keepers pay their bill once a month by check and do not permit the drivers to enter the store ice box under any circumstances. Some stores carry as many as four brands of milk and, therefore, require service from four individual companies each day. Others limit their milk purchases to two brands of milk and, therefore, have higher purchases from each of these two than if their milk volume were distributed among more dealers.

Delivery costs to stores, as a result of these differences in practices, varied by more than one cent a quart.

Profits per quart for distributing to homes ranged from a profit high of 1.3 cents per quart to a loss per quart of .8 cents. Including differences in selling prices, packages and products, store distribution functions showed a range from 1.6 cents profit to a loss for one enterprise of over 2 cents. These facts indicate the difficulty in attempting any generalization regarding the unit profit available for all companies under any given amount of spread. Evident also is the impracticability of attempting to lower the spread for the distribution of milk by a universal reduction in profit across the board. If the combined audited unit profit of all participants in the functions between farm and consumer were to be eliminated, very little could be accomplished in reducing prices to consumers or in increasing producers returns. However, substantial opportunities for consumer price reductions are within reach by having all participants in the spread emulate the most efficient practices and methods which are now in operation.

The combined procedures of functional cost accounting, time study analysis and market analysis do provide opportunities for searching step by step for those things which can be eliminated

from the spread and can bring the prices to producers closer to the prices to ultimate consumers.

Once the functional costs had been determined, the problem still remained as to how they could be presented. At one time it appeared feasible to present the array of costs within each function and select from this range certain measures as, for example, the median and first and third quartiles. These measures could in turn be presented in a cumulative series so as to report the absorption of the spread among the various functions.

Two principal difficulties to this procedure developed because of the nature of the New York market.

1. The spread differed among the distributors. Although milk was bought by all under a uniform price plan there were material differences in the cost of milk because of variation in fat content, transportation costs, premiums, and the like. Also, there were substantial differences in selling prices as between brands.

2. Each recognized function had been clearly differentiated from others. In each instance, cases were studied in which the particular function was the only one performed by the dealer or handler. Nevertheless, the complete functional analysis introduced an element of unreality since in practice most of the distributors carried on the various functions in a pattern of operation which involved considerable interdependence among the functions.

To meet these difficulties the results were finally presented company by company in parallel columns with the functional costs for each company displayed for comparison.

Other methods of analysis and presentation were considered. The time studies by functions could have been refined by detailed motion and methods analyses but this refinement might well be the objective of another study after the large opportunities for cost and price reductions made possible by adopting changes in the general practices have been accomplished.

Similarly, a model plant on a theoretical basis might have been developed from the information available from the case studies. This, too, may be the objective of another study.

With the method of analysis used the profit (or spread available for use and risk of capital) was the residue after all functional costs had been absorbed.

Had the determination of profit been a primary objective of the

study, the traditional audit method would have served better. This method places emphasis on end profit results, as shown by completed calculations, and a large gross sample is within reach at reasonable survey costs. The profit experiences of the participants can be related to the amounts of sales revenue, invested capital, and other indices of risks to establish a basis for moralizing about the rewards which are enjoyed by those who perform the essential functions. The combining of the audit results, however, assumes a uniformity in costs and in prices which may be contrary to fact. Assuming a uniformity in costs and prices also implies a uniformity in the methods, procedures, and arrangements by which the functions are accomplished.

Any method which undertakes to treat results of studies of this type by ordinary statistical procedures will encounter difficulties. The case method of study applied to a stratified sample appears best suited for either the audit or functional cost method. When the entire operation of assembling, processing, and distributing milk is broken down into segments, whether they be operating subdivisions or functions, statistical treatment is simpler. As the businesses are broken apart for study, the parts of the various companies bear a greater resemblance to each other than do the companies when compared in their entirety.

THE MIDWESTERN EGG PROJECT

HERMON I. MILLER

Production and Marketing Administration

A STUDY of the deterioration of egg quality in marketing channels in 13 Midwestern states was undertaken last year by the United States Department of Agriculture and the agricultural experiment stations of those states. The project had three principal objectives:

- (1) To ascertain the quality of eggs at the time they are marketed by producers.
- (2) To determine the change in egg quality that occurs during the time that the product moves from the country buying stations to the central assembling plants.
- (3) To analyze market practices that influence quality change.

A Technical Committee provided guidance for the project. This Committee consisted of a representative from each of the 13 experiment stations, and a representative from each of the Federal agencies. The Technical Committee requested the Poultry Branch to act as coordinator for the project, and assigned the Coordinator the responsibility for developing suggested procedures and survey forms. Final decision on the scope of the project was made in November, 1947. Field work actually began in February, 1948.

Two steps in the procedure I think are worthy of consideration here. The first was the development of a work project outline which indicated in detail what, when, and how each cooperating agency would do the work which it was best fitted to do. The second was a meeting held in each state, to which the project leader invited all those who might be interested in the project—representatives of the State Department of Agriculture, Federal-State grading personnel, research, Extension and teaching members of the poultry husbandry and agricultural economics departments, and in some instances the State Agricultural Experiment Station directors. At this meeting, the objectives of the study and the work plan were discussed in detail. Insofar as possible, the sample of egg handling plants to be included in the study in each state was determined, and questionnaires, which previously had been prepared in preliminary form, were discussed. My own feeling is that this series of meetings was one of the important steps that contributed to the success of this regional undertaking. The research worker in each

state had complete support of his Administrator, the Extension workers, and others interested. Anyone within the state who was interested in the project had an opportunity at this meeting to contribute to its development. I strongly recommend these two steps in the development of all regional projects.

The work plan called for obtaining, as a first step, records of so-called egg concentration plants in the 13 states—plants where eggs are assembled for carlot shipment. These records were obtained by members of the Poultry Branch. The sample drawn consisted of 235 plants of this nature, well scattered throughout the region.

Information was obtained from the carlot assemblers about the buying stations that supplied them with eggs. The state agricultural experiment stations surveyed a sample of about 830 from the list of buying stations secured in this manner. The next step was to determine the grade of eggs moving through this procurement system as follows: In April, to represent the spring flush egg-production period; in July and August, to represent the hot summer months; and in October and November to represent the season of short production and high prices.

The services of the regular grading and inspection personnel of the Federal Department were used to determine egg quality. Each case of eggs inspected at a country buying station was identified with a sticker. The buyer was asked to handle the product in the usual manner, and when the sample of eggs which had been graded at the buying station arrived at the central plant, the same person was there to re-grade it. As previously indicated, this procedure was repeated three times during the year. During the three seasons we obtained gradings of 7,267 lots of eggs. The producers were identified on about 3,500 of these lots.

In addition to the field survey work the Bureau of Agricultural Economics obtained in April and in August, through mail questionnaires, information direct from producers regarding their marketing practices. With this background it is possible to determine the significance of the findings of the quality analysis.

The Farm Credit Administration studied the significance of graded buying programs and their influence on producer and handler practices. This work was confined to Missouri and Ohio. The Committee felt that graded buying programs might be one of the procedures that should be recommended to improve quality, and that this investigation might contribute to the soundness of such a recommendation.

Some of the Findings

The Committee recommended that two reports be prepared. The first covers the grading aspects of the study. This bulletin was printed by the Michigan Agricultural Experiment Station. The second, which will be printed in restricted numbers, will provide a great deal of background information regarding plant volume, merchandising practices, procurement procedures, etc., and will indicate the relationship of these factors to quality.

In addition to these two reports, a short, popular-style publication will be prepared by the Production and Marketing Administration. It will summarize the results of the grading work.

Quality of eggs received from producers. The producer lots representing eggs from the entire region for the three seasons averaged 66.7 percent A quality or better. About 11 percent of the eggs contained in these lots were classified as stains and dirties.

The 13 states were divided into three sub-groups, as follows: The Lake States, which included Minnesota, Wisconsin, and Michigan; the Plains States, which included the Dakotas, Nebraska, and Kansas; and the Corn Belt States, which included Missouri, Iowa Illinois, Indiana, Ohio, and Kentucky. When producer quality was studied according to these three subdivisions of the region, we found that the Lake States had the highest and the Plains States the lowest quality for the three seasons. The greatest difference occurring during the summer months. The Lake States also had fewer eggs which were classified as stains and dirties.

The information on producer quality was analyzed to determine what influence, if any, several different factors had upon variations in producer quality. The factors studied were: (1) method of delivery, (2) method of sale, (3) size of shipment, (4) color of shell, and (5) type of buyer. The most significant findings in this analysis were those concerning the method of sale—that is, whether the producer sold eggs on a graded or an ungraded basis. Eggs sold on a graded basis averaged about 70 percent A's, as compared with about 60 percent for those sold on an ungraded basis, and the graded eggs contained less than half as many stains and dirties.

Quality changes during marketing. There was considerable loss in the quality of producer-delivered eggs while they moved through the country buying station marketing procedure.

The number of A quality producer-delivered eggs declined by approximately 10 eggs per 100 as they moved through the country

buying station. The number of checks contained in the eggs delivered by producers increased by approximately one percent. It seems to me that this is one of the more significant findings of the study. In the past, considerable emphasis has been put on educational programs with producers to improve egg quality, but little attention has been paid to the decline of quality of eggs as they travel through the marketing process. The deterioration study will provide our Extension Service and interested trade associations with facts upon which to base educational programs with producers and handlers as well.

Several factors were explored with regard to their relationship to quality change. The most important factor was the time between the first and second gradings. The effect of time and temperature, of course, is very much interrelated in its effect on egg quality changes.

I want to suggest several things which I believe are necessary if a regional research undertaking is to be accomplished successfully.

First—the project must be one which is truly regional in nature —i.e. one where states have a common problem that can be solved or answered thru similar research or one where it is necessary for each state to participate to provide a complete picture of the area to be studied.

Second, there should be complete cooperation from all the research workers.

Third, a coordinator should be selected and given authority and responsibility. The coordinator should preferably be a person whom the State project leaders choose because of their desire to work with him, rather than because he represents a certain agency.

The coordinator should have freedom to travel throughout a region and not be restricted to working inside the boundaries of a single State. On this point, too, I think that oftentimes a coordinator is selected who has a full-time job within his State and who therefore cannot give proper attention to the work throughout a region.

And finally, I think it is very important for each worker concerned with the research undertaking to feel that he has had a definite part in developing work procedures and plans, and that he is in wholehearted agreement with them. The meeting procedure is one way to bring this about.

DEVELOPMENT OF REGIONAL COTTON MARKETING RESEARCH

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THE Regional Cotton Marketing Research Project is conducted under the authority of the Research and Marketing Act and is subject to the over-all policies established by the Administrator of that act. The Technical Committee has assumed the authority for formulating policies for the cotton project in line with the over-all national policies and has accepted the responsibility for the operation and the development of the study. The Chairman of the Technical Committee and the Advisory Committee is responsible for carrying out the instructions of the Technical Committee and the handling of administrative questions.

Approaches Used

No hard and fast decision was made by the group regarding the type of regional research to be undertaken. They expected their first efforts on the project to be partially experimental in nature and to aid in determining the most productive approach to be used as the project developed. During the first phase of the study a uniform cooperative approach was attempted. During the second phase a looser form of collaboration or a coordinated approach was tried. At the present time the group has moved back in the direction of a uniform cooperative approach but certain problems will be studied under a coordinated arrangement. This shifting of emphasis from one approach to another can best be understood by briefly reviewing the development of the project.

Because of the delay in appropriating funds for the project and because of the shortage of personnel, it was impossible to develop specific plans for the first phase of the work until late in the 1947-48 marketing season. In January of 1948 the Executive Committee met with representatives of several of the cooperating groups and developed detailed plans for the first phase of the study. It was the desire of this group to develop a plan of work which would aid in delineating and classifying the problems of cotton marketing and in forming a basis for future planning of the project. In developing these plans, the group decided that certain basic information would be needed regarding the marketing practices in local

markets throughout the cotton belt and, therefore, a uniform or cooperative approach would be most desirable. The group also wished to investigate the extent to which the one-variety production program had affected marketing procedures and the study was conducted in such a way as to permit comparisons between communities which were organized for one-variety production with communities which were not thus organized. Uniform sampling procedures were decided upon and uniform schedules to be used by each state were adopted. In the development of the study, however, the uniform sampling procedure was not followed in all cases, either due to misunderstanding on the part of the cooperating states or because the representatives of these states felt that the proposed sampling procedure was not adapted to some local conditions. Also considerable variation developed in the interpretation of terms and questions included in the schedules. The delay in starting the project had prevented the establishment of a pilot study and even discouraged adequate field testing of the schedules. As a result, the schedules were not as well designed and the data secured not as useful as they might otherwise have been. These conditions made the preparation of the regional report more complicated and difficult and restricted the conclusions which could be drawn. Preparation of the regional report was delayed by the failure of some states to submit data to be included until many months after the field work was completed.

In the development of the first phase of the study several distinct but related problems presented themselves which warranted immediate investigation. If the cooperative approach followed during the first phase of the study were continued only one of these problems could have been considered at that time and the study of the remaining ones would have had to be delayed. Moreover, the states were not in a position to begin a belt-wide cooperative study of the cost and efficiency of marketing—the phase which was felt to be the core of the problem. Certain basic information regarding the marketing process was lacking, personnel needed additional experience, and certain research procedures needed to be tested. On the other hand if a looser form of collaboration were adopted and only one or two states worked on each of these related problems, some study might be given all the proposed topics immediately. The information developed in this way by each group of states would be supplementary to the information obtained by

other groups and it would not be necessary for all states to work on each problem. In view of the limited funds and personnel available and the pressing need for information on the several related topics, it was decided the best results could be achieved if a coordinated approach were followed and the efforts of the group were divided between the several problems. Some states, therefore, began a study of mill requirements and buying practices to determine the extent and nature of mill demand for cotton. Some studied the marketing of cotton identified as to variety and year and area of growth and investigated the possibility of expanding bale identification to a wider area as a means of improving marketing procedure. Others conducted a pilot study of means of reducing and increasing efficiency of marketing in order to develop and test methods and procedures which could be adapted by the remaining states in expanding this study in subsequent years. Still others devoted their efforts to an investigation of certain phases of one-variety cotton production which appeared to need further study.

The coordinated approach revealed information on a wider range of topics than would have been possible if the more restrictive cooperative approach had been used. By providing an opportunity for testing certain research procedures on a limited basis, this approach also enabled the group to discover errors in these procedures before they were applied to the entire region.

During the third phase of the study which is now under way, a combination of both the cooperative approach and the coordinated approach is being followed. Additional experience and the testing of procedures during the second phase of the project have enabled the states to plan and get under way a belt-wide study of the cost and efficiency of marketing cotton through various channels. Variations in marketing practices from one area to another revealed in an early study, suggested the desirability of approaching this problem on a belt-wide basis and of employing uniform sampling procedures and uniform schedules. In addition to the belt-wide study in which most of the states are cooperating, the study of some problems already under way are being continued. Some states which are cooperating on the cost and efficiency study will also do some further work on mill requirements and buying practices, the marketing of cottonseed, or one-variety cotton-production. Others will conduct detailed cost studies of certain segments of the marketing system to provide factual information regarding these seg-

ments and also to test various methods of conducting costs studies which can be used by other states in the further development of this phase of the project.

The group is aware that the study of cost and efficiency of marketing cotton through various channels will be an extremely difficult and complicated one. It is also realized that even under the most favorable conditions this study will require a number of years for completion and if it is to succeed at all, it will require the co-operation of a large part of each segment engaged in the marketing process. In developing the study the workers will need the constant aid of statisticians, cost accountants, transportation specialists, industrial engineers, and others. This is a very ambitious program, particularly in view of the continued shortage of personnel and funds and the lack of experience of available personnel. In spite of these many difficulties facing the group, it is believed the importance of this problem justifies starting the study at this time. The study can reveal information of great benefit to the cotton marketing system and if the group working on this project is given adequate time and funds to develop the study in a careful and detailed manner, a valuable contribution will be made toward improving the competitive position of American cotton.

Some Benefits and Problems

The studies already completed or under way have provided a considerable volume of basic information regarding marketing practices of producers and buyers in local markets and the operation of gins, warehouses, and mills. Information has been developed regarding the one-variety cotton producing communities which certain agencies have already utilized to a limited extent in developing their programs. Fragmentary information has been obtained on the movement of cotton from local markets to mill points and on the functioning of the agencies involved in this process. The direct results of the study, however, are of less importance than such indirect benefits as the training and experience provided research workers and the contacts which have been established with various segments of the cotton trade. Also of great value have been the testing of various research procedures and the determination of the procedures which promise to yield the best results. Unfortunately, procedures and tools of analysis have not been

developed in the field of marketing research to the same extent as in some other fields of agricultural economic research, but must be developed before very rapid progress can be made.

In the conduct of the study certain difficulties were revealed which are due to the character of marketing research and which are common to all research in this field. In the study of marketing the research worker comes in contact with a number of economic segments, many of which may be unfamiliar to him. Producers, buyers, representatives of transportation agencies, processors, wholesalers, and retailers may all be contacted. Neither the training nor experience of most agricultural economists has fitted them to work with all of these various groups. Each of these segments is possessed of its own highly specialized field of information and the researcher must have a considerable knowledge of each field if he is to develop his relationships and conduct the study efficiently. A knowledge of general economics is required, however, for proper interpretation and thorough analysis of data. In the past, relatively little emphasis has been placed upon training along these lines and the opportunity of gaining experience in this field has been limited. Certainly few working in this field at the present time possess all these characteristics and some of the time spent on the project necessarily has been devoted to the training of personnel. Heavy turnover of personnel has further complicated the problem of maintaining a staff that has the training and experience necessary to carry on the study.

Lack of cooperation on the part of some segments of the trade has caused considerable difficulty. Many members of the trade are hesitant to reveal information regarding the operation of their businesses. This hesitation may be due in part to the belief that the results of the findings might be disadvantageous to the trade, but it is also partially due to distrust of the researchers and fear that information regarding the operation of individual firms will be revealed. In the past, experiment station workers generally have not developed contacts with the cotton trade and buyers have no basis for judging the integrity of the workers. Work on the project thus far has demonstrated, however, that better cooperation can be obtained after the members of the trade and the workers become better acquainted. As the project has developed the researchers have become more familiar with their job, learned some

of the problems and the way of thinking of members of the trade, and are in a better position to explain the purposes of the work and to gain the confidence of the people being interviewed.

Some segments of the trade have also expressed skepticism as to the ability of researchers to be of practical aid in conducting their businesses. This skepticism has been partially overcome in those instances where trade representatives have been asked to participate actively in the planning and development of the study. These representatives have furnished suggestions which have made the results more useful to the trade and aided in securing better cooperation. Some workers on the project have expressed fears that this procedure would lead to trade domination and the use of the project as a propaganda weapon. Such developments as these must be guarded against but in the development of the cotton project thus far there has been no evidence that any segment of the trade has such inclinations.

Some of the important problems in developing the project which are related to its cooperative nature have already been mentioned. These include the difficulty of establishing administrative machinery, of determining the authority and responsibilities of members of the group, of obtaining uniform procedures in the several states, of keeping an agreed-upon time schedule. Considerable progress has been made toward the solution of administrative problems but questions still exist regarding certain phases which will require further consideration.

AGRICULTURAL MARKETING RESEARCH AT THE UNIVERSITY OF CHICAGO

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LIKE much of the current research in the marketing of agricultural products, the "Chicago project" is concerned with marketing efficiency. To be more specific, we are attempting to: (1) draw the outlines of a concept of marketing efficiency which is consistent with (and hence derived from) widely agreed objectives of economic policy; (2) apply this concept to a determination of the extent to which too few or too many resources are employed in producing marketing services; (3) identify the factors which tend to reduce the efficiency of the marketing system below its maximum (with given preferences and available resources and technology), noting particularly the influences which might be altered by public policy; and (4) describe (largely by means of statistical estimation) some of the relationships which are relevant for measuring efficiency and the importance of certain forces which influence it. In approaching this problem we hope to apply to marketing research those parts of economic theory which have proven useful in other areas of economic research. We also hope that, from our findings, hypotheses might be developed which may prove useful in research relating to sectors of the economy other than marketing.

In the following pages I shall try to make clear some of the basic assumptions underlying our analysis and describe in more detail parts of the project and some of the hypotheses which are being tested.

The Concept "Marketing Efficiency"

Any appraisal of economic institutions must be made with respect to some norm—an ideal situation or a set of situations which is considered to be the "best" of those situations which are possible. This ideal situation is derivable from (1) the value system of the society served by the institution being appraised, and (2) the beliefs (facts and things that pass for facts) describing the various situations which are possible.

The various possible production situations are definable given (1) the supplies of various resources and (2) the ways in which these resources can be converted into products. These two sets of

data delimit the various "production possibilities"—the various combinations of products which might be produced and thus the sacrifices of some products which might have to be made in order to secure more of others.

Assume that we can divide the products of the economy into

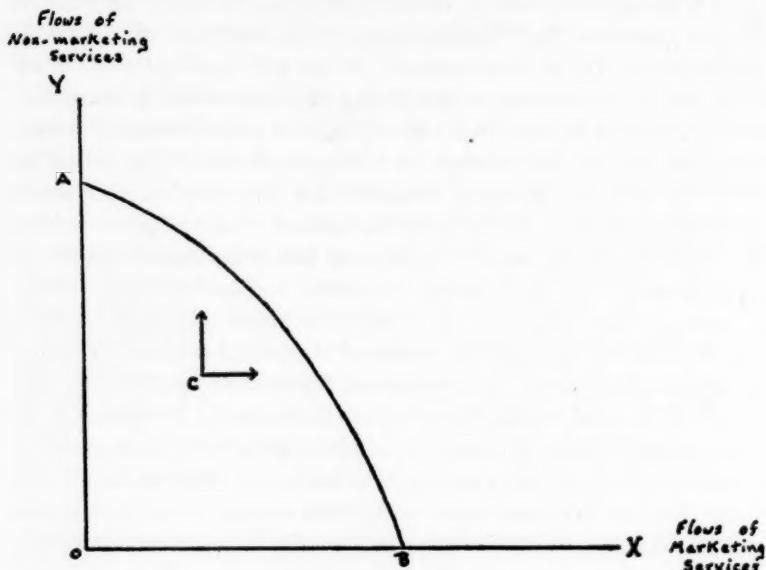


FIGURE 1

The points in the space OAB represent various "production possibilities." Any point on the line AB represents an efficient point in the sense that an increase in the flow of X cannot be obtained without a decrease in Y , and vice versa. At any interior point (say, point C), production of both X and Y could be expanded without any increase in the amount of resources used.

two classes—marketing services and non-marketing services (both commodities and services). With a given collection of resources and ways of converting resources into products, the set of "production possibilities" might be described as the convex set OAB in Figure 1. Any point in the space OAB represents a combination of the two classes of products which it is possible to produce. Any point not on the line AB —the boundary of the set—represents a situation in which more of one product could be produced *without* sacrifice of the other product, while a point on AB represents a situation in which some of one product *must be* sacrificed in order

to produce more of the other. The points on *A B* have thus been characterized as "efficient points."

Production of a combination of products which is not an element in the set of "efficient points" indicates that either (1) the best of available technologies is not being employed or (2) the combination of resources employed to produce a given amount of product is

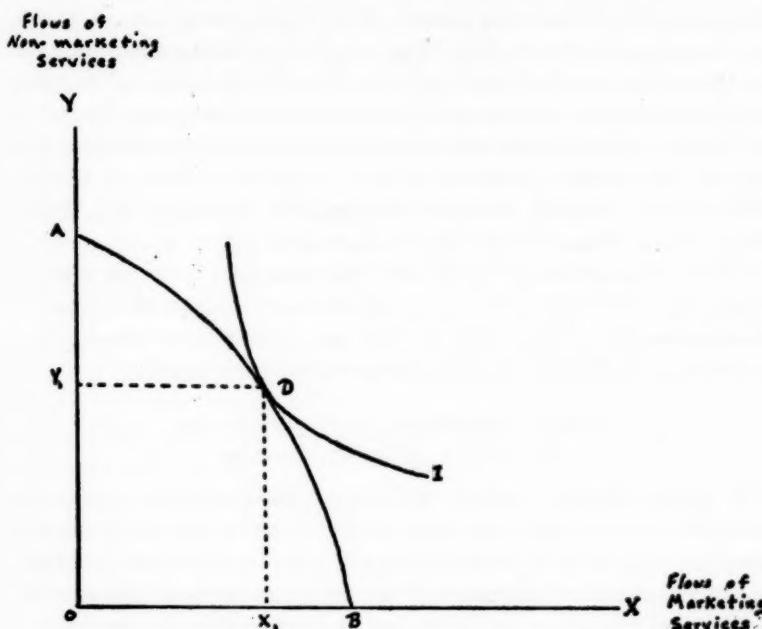


FIGURE 2

The curve *AB* is the same as that in Figure 1. The curve *I* represents combinations of *X* and *Y* which are equally satisfactory to the community as a whole with a given income distribution (see footnote 1). Hence *D*, where X_1 of marketing services and Y_1 of non-marketing services is being produced, represents a position of maximum welfare.

not optimal. An improvement in technology can be represented as a movement of the boundary away from the origin.

If we know consumer preferences and the "best" distribution of income, we can select a single element of the set of "efficient points" and denote this element as the best combination of products. This element will also be one in a subset of product combinations which are equally satisfactory to consumers—a "community indifference"

curve (see Figure 2).¹ Any departure from this element (represented as a point of tangency between the line $A\ B$ and the "community indifference" curve) would indicate that, with the given preferences and income distribution, consumers had relatively too much of some products and too few of others compared with what they prefer and could be produced. Since the preferences of various consumers are not identical, the element which denotes the best position may differ with each income distribution, there being a different "community indifference" curve for each distribution of income. Rather than specifying a single income distribution and hence a single element in the set of production possibilities as "best," it probably is tactically desirable to consider each element corresponding to any income distribution as equally desirable and to thus define a set of best positions. Judgments regarding the "best" distribution of income are thus deferred to policy makers.

Given this set of best positions, the concept of efficiency is obvious. An economic system is as efficient as possible whenever the flows of products are those in this set. The degree of economic inefficiency is thus the degree of departure from this set.

Factors Accounting for Inefficiency in Production of Market Services

It appears highly unlikely that the firms producing marketing services are using the best technology or are using the optimum combinations of resources for producing the present flows of marketing services. In the language of the previous analysis, the present production situation probably can be represented by an interior point rather than an efficient point in the set of "production possibilities." However, when one compares the marketing sector with

¹ By a "community indifference" curve, I am referring to a curve showing the combinations of two commodities which will leave each member of the community indifferent as to which combination is available to the community as a whole. Assume, for example, a community composed of two individuals, A and B , and having available flows X_1 of commodity X , and Y_1 of commodity Y at its disposal. Assume further that A gets X_A of X and Y_A of Y thus making $X_B = X_1 - X_A$ and $Y_B = Y_1 - Y_A$ available for B . If the amount of X is reduced from X_1 to X_2 , Y must be increased so that A is as well off as he was with quantities X_A and Y_A and B is as well off as he was with quantities X_B and Y_B in order that the new situation be equivalent to the old. Community indifference curves may intersect, since if the initial distribution of X and Y between the individuals were different and the preferences of A and B are not the same, the amounts of Y required to leave them as well off after the reduction in X as they were before will differ. (Refer to T. Scitovszky, "A Reconsideration of the Theory of Tariffs," *Review of Economic Studies*, IX: 89-110 (1942), for an example of the use of the community indifference concept.)

the rest of the economy and examines the factors which account for departures from the boundary points, it is my judgment that the bulk of the marketing sector of the economy will be appraised as relatively efficient.

Let me emphasize that the above judgment is a tentative one made without adequate empirical investigation. It is one of the hypotheses which we are testing. A test which would be unquestioned by most research workers would require knowledge of all relevant production functions (not only in marketing, but in the rest of the economy as well), resource supply functions, and consumer preference systems. In addition, it would require knowing how production decisions are made and whether they might be improved. Such knowledge, if attainable, obviously is beyond the range of this project. However, it is my belief that considerable progress can be made toward appraising the economic efficiency of various sectors of the economy through examining data which are already available and from which can be estimated such factors as rates of return to various resources in various uses, the movement of labor and capital between industries, comparative conditions of entry of new firms, differences in required labor skills, degrees of risk, and other relationships which will present at least a sketch of relative efficiencies of various industries.

My tentative judgment regarding the relative efficiency of the marketing system depends to some extent upon a modification of the previous definition of desirable situations to take into consideration lack of knowledge about the future and the kinds of changes which may occur in the data facing those who make production decisions. With any given initial situation, the set of possible situations at any time depends upon decisions made in the past by the various economic units in response to their expectations regarding the future. Other factors not subject to control, however, influence the positions which actually could be achieved. It is possible to select at the present time, from the set of expected possible situations for some given time in the future, a subset which can be considered as most desirable. When the given future time becomes the present, however, this subset may not be the one which is in fact most desirable. Nevertheless, with the knowledge available at the time when the decisions were made, any course of action other than that chosen would have been considered as leading to results inferior to those expected from following the course which was

selected. Consequently, unless we are to damn the system for failing to perform something which it may be incapable of performing, we must examine and appraise the way in which production decisions are made in the light of the information available to decision-makers.

Assume that my judgment about the production efficiency of the marketing system was confirmed. Then, aside from the errors resulting from lack of information relating to possible ways of producing—errors which could be reduced by more widespread dissemination of knowledge relating to technological possibilities—greater efficiency in marketing could be obtained largely through institutional modifications which would reduce uncertainty. Some of the modifications required would necessitate costs greater than those imposed by the uncertainty which they would reduce and hence would not be feasible. Others, however, appear to be achievable at relatively low costs.

Among the latter are modifications which would reduce the uncertainties imposed by inflation and depression. The flexibility which it is profitable for the firm to maintain in order to meet the wide variety of employment and price level conditions which have prevailed in the U.S. during the past three decades discourages long-term commitments of the kind which would increase economic efficiency. While this is not the appropriate place to debate which measures relating to the stabilization of such variables as the general level of prices or unemployment should be used, it can be pointed out that such stabilization measures—whether they be flexible taxes, flexible wage rates or flexible government expenditures, for example—transfer the flexibility away from the firm to a part of the economy where the costs of achieving it may be considerably lower.

Reducing the variability in the supplies of certain agricultural products would reduce marketing costs both through its impact upon uncertainty and through the decrease in excess capacity of processing firms which it would permit. It is my judgment that costs of reducing the year to year variability in livestock supplies would be less than the reduction in processing costs which would result. The year to year fluctuations in livestock supplies are largely related to the variability in feed supplies—variability which could be reduced at relatively low costs by appropriate feed storage policies. Here, also, the flexibility which now must be achieved by the firm would be transferred to another sector of the economy—

the grain storage sector—where the costs may be relatively low.

Other potential institutional modifications which would reduce marketing costs include changes in labor arrangements within processing firms subject to wide variations in levels of operations. In particular, the range within which firms must operate in order to avoid paying overtime or for time not worked is too narrow, given the wide range of volume levels which may prevail and which cannot be accurately forecast. Modifications might be made which would not impose undue burdens upon labor yet would permit more efficient labor utilization.

*Inefficiency Resulting from the "Wrong"
Production Pattern*

A second class of divergences between actual and optimal conditions is the relative overproduction of some goods and services and underproduction of others. Although the assumptions underlying many of the current judgments are not clearly set forth, a basic one appears to be that too much marketing service is being produced; i.e. that if certain services were eliminated, marketing costs would fall enough to more than compensate the consumer (and also the farmer) for the loss of the service. This assumption may be correct for some marketing services. However, if applied to marketing as a whole, it appears to be in conflict with evidence gathered from analysis of family budget data which show that almost without exception, money expenditures upon a commodity rise proportionately more with increases in income than do the physical quantities consumed. Increase in money expenditure with physical quantity held constant reflects an increase in "quality" of the product as well as an increase in processing and in other marketing services. However, in cases where there were no apparent quality changes, most elasticities of expenditures have exceeded the corresponding elasticities of physical quantities.

While this evidence is not definitive, it suggests that marketing is a part of the economy which will grow relative to that part which produces the raw materials, because consumers prefer to add services as they get richer. Examination of the trend of shares of the national income attributable to various sections of the economy adds confidence to this forecast. Reducing the amount of services might lead to reductions rather than increases in marketing efficiency.

There may be factors in the non-marketing sector which would

induce production of too many marketing services. As long as there is relatively "free" entry of firms into producing the various goods and services, the economic system contains a means more or less automatic which discourages long-run structural maladjustments of the kind that lead to overproduction of some things and underproduction of others. Much of the marketing sector of the economy is relatively easily entered. Capital requirements usually are not large compared with those in other industries. Hence, there is not likely to be underproduction of marketing services for any prolonged period of time.

Whether or not there is relative overproduction of marketing services under these conditions depends upon freedom of entry into other sectors of the economy. If entry conditions in some sectors are restricted, relatively too many resources may be forced into the "free" sectors. It has been argued that there are too many farmers and too many small retailers—foodstore operators, shopkeepers, and proprietors of filling stations being examples. While it is true that money returns to labor in these sectors have been relatively less than in most other sectors of the economy (excluding parts of agriculture), it does not necessarily follow that the real incomes of the supposed excess of these small entrepreneurs would be increased if they were to move elsewhere. Since 1943, adequate opportunities have been available for jobs in other parts of the economy. If there has not been sufficient movement to equalize money returns to comparable skills, there is a general presumption that non-monetary elements of income are relatively high in these areas. In any event, if corrective action is called for, it would appear to be of a kind which would reduce the degree of monopoly in the non-marketing sector of the economy.

Efficiency and Income Distribution

So far I have said nothing about the effects of the marketing system upon the distribution of income and have evaluated efficiency solely in terms of effects upon total income. In view of the fact that much of economic policy is designed to change the distribution of income from that which otherwise prevails and that most policy disagreements revolve around differences in judgments as to what the distribution of income should be, this omission may be considered a serious one. This is not the appropriate place to debate the merits of increasing or diminishing farmers' relative incomes by means of public policy. It can be demonstrated that—whatever is

decided as the "best" income distribution—using the marketing system (through its influence on price) as a means of achieving it is not appropriate in the sense that the total income to be distributed will be smaller than if direct taxation and subsidization is employed. Production possibilities will be more favorable (more of some commodities will be produced without sacrifices of other products) or the bundle of commodities produced will be more desirable, or both, if the direct methods are used. Thus, if it is believed that farmers should have larger incomes, a more appropriate device for making the change is a tax upon non-farmers, the proceeds being transferred to farmers.

Empirical Estimates Relating to Marketing Costs

The more intensive empirical work which we are undertaking is an attempt to estimate the effects of fluctuations in hog supplies upon pork processing costs. In this study we have been fortunate in securing the aid of managements of a few meat packing concerns in helping us to determine what factors are important and hence what things we should try to measure. One firm has given us detailed data from which we hope to estimate production functions for two plants—one in which supplies are relatively stable seasonally and one in which there are rather wide fluctuations both seasonally and annually. From these data we hope to be able to estimate the production functions for the two plants. Other costs—such as storage costs—can be estimated from aggregate data.

To date, we do not know what inferences we can make regarding the industry as a whole from the estimates which we might make. The similarities in technical processes used in hog slaughter by various firms comprising the bulk of the industry suggest fairly wide application of the results obtained from only one firm. However, there are difficulties in interpreting the statistical estimates which can be made from firms' cost data, unless one has considerable knowledge of the ways in which various production decisions are made. For example, it might be that the firm has too little (or too much) curing capacity; that it could improve its estimates of the time distribution of slaughter and thus reduce overtime and the employment of extra gangs. If any of these conditions hold, the observed cost at any level of slaughter cannot be considered as the minimum for this level. Nor can "mistakes" necessarily be considered as random deviations from the "true" function.

Any short-run savings from reducing the magnitude of fluctua-

tions in hog supplies would, on *a priori* grounds, be expected to be smaller than the long-run savings. The costs of changing the pattern of farrowings would be smaller in the long run (supply functions for the resources being more elastic) and the reduction in processing costs would be larger, there being an opportunity to adjust numbers and sizes of plants to the more stable supply situation. Thus, if short-run costs in a given plant could be reduced by X percent as a result of more stability in hog supplies, long-run costs should be reduced by more than X percent, since new plants could expect to operate within a narrower volume range.

Measuring these long-run cost differences, however, is even more difficult than measuring the short-run differences. It involves knowledge of technology applicable to livestock slaughter and the manufacture of pork products which may not have been known to many firms and which if known, may not have been applied in the construction of existing plant and equipment because of the variability in supplies.

As a first approximation, one might assume that the production function for the packing industry as a whole in the long run is such that a one percent increase in slaughter could be achieved by increasing the resources used by packing firms by one percent. If this were the case, long-run costs per unit need not exceed the minimum unit cost of any plant now in operation. Further knowledge regarding the potential technology of packing operations may reveal an even larger potential cost reduction than that which would be estimated by the procedure described above.

Along with the estimates of the changes in processing costs which would result from various changes in the variability of hog supplies, we are also attempting to estimate the changes in hog production costs which would accompany the changes in the time distribution of farrowings. Here, again, the estimates may not be sufficiently accurate because of the lack of adequate data. However, analysis of farm records and feeding experiments will yield some clues regarding these costs.

Measures to Reduce Supply Variations

If one knew accurately the magnitude of the costs imposed by hog supply fluctuations, he could determine whether it is desirable to suggest action which would reduce them, and if so, which of the various possible courses of action would be most desirable. There is

a general presumption that if the costs imposed by these fluctuations exceeds the cost of reducing them, some private economic units would take steps which would further reduce these variations. For example, it might be assumed that the normal seasonal pattern of hog prices portrays a combination of the costs of variations to processors and farm costs of farrowing hogs at various times. If the seasonal price movement were greater, the time distribution of farrowings would be more regular. But, packers would not save enough as a result to be able to pay the higher prices during what has been the low volume periods. This argument appears valid—assuming that both packers and farmers have complete information with respect to costs of these variations. Movement toward less seasonality in hog production during and immediately following the war suggests that farmers have overestimated the costs of reducing the variability in hog supplies and that the problem is largely one of providing them with adequate information. Evidence that meat packers have lost money, in the long-run, as a result of pork storage operations suggests that the seasonal price variation has been too small.

As indicated previously in this discussion, annual fluctuations in hog supplies appear to be closely related to fluctuations in supplies of feed grains. This is particularly true at the fringes of the Corn Belt. It is desirable that feed grain prices change with the availability of feed grains in order to encourage their efficient use. And little can be done about changing the weather to reduce yield variations. However, variations in the amount of feed stored is a way by which the fluctuations in crop production could be absorbed without equivalent fluctuations in livestock output. It appears that the function of storage in absorbing fluctuations in feed production has not been exploited as fully as would be most efficient from the standpoint of the economy as a whole. A relevant question is, "Why has not the private economy utilized storage as efficiently as is desirable?" Here, again, uncertainty with regard to prices may be an important factor. While there may be grounds for public action to help stabilize feed grain prices through a public storage program (perhaps the ever-normal granary) and through extension of credit to farmers to hold grain on farms when crops are above average, it seems reasonable that the private economy would utilize storage more effectively if the general level of prices were more stable.

I have tried to outline the basic presumptions (I hope they are not prejudices!) underlying our marketing research and the kinds of empirical estimates which we are attempting to make. To adequately test all of the hypotheses which will be suggested would require more resources than are available to our project. However, we hope that some of the questions we will unearth will prove of interest to other research workers and that some of our procedures will have an application to problems other than those which we are attempting to solve.

DISCUSSION

BENNETT S. WHITE

Bureau of Agricultural Economics

Around the Department we include studies such as we have had presented here in the general category of costs and margins work. As I see it, the job of the marketing economist working in the margins and costs field, and the objective of margins and costs studies is to supply the facts, which are now largely lacking, with respect to what marketing margins and charges are, what services they pay for, how these services are performed, and what might be done to reduce their cost. On the basis of the facts which he finds and the analyses which he makes, intelligent policies and programs can be formulated. Marketing economists are under tremendous pressure to do this job and to do it quickly, and I am inclined to believe that studies in the cost and margin field constitute the heart of the RMA program.

Dr. Young's study of milk marketing costs and efficiency in New York City is one of the most extensive and thoroughgoing studies of its kind. I do not believe that economists have as yet devised a satisfactory basis for segregating the cost of performing an operation with respect to a particular commodity or service when the same resource or resources are utilized to produce a number of goods or services. This, of course, is the familiar problem of joint costs. As Dr. Young says, the combination of functional cost accounting on a uniform basis, time and motion studies, and market analysis provide the basis for a searching out of those methods, practices and services which account for the various marketing charges. In addition, by indicating differences in cost and efficiency between the various individual firms, his study shows how it should be possible for all participants in the spread to emulate the most efficient practices and methods which are now in operation.

The North Central egg project discussed by Mr. Miller represents a successful effort to coordinate the resources and interests of a number of states and federal agencies in the achievement of limited objectives. This study should provide a valuable basis for further work which should include demand studies designed to measure the breadth of the market for

eggs of improved quality, and other studies in which price premiums and increased incomes to producers arising out of the marketing of better eggs may be compared with the additional costs involved in effecting quality improvements.

The cotton project discussed by Mr. Faught portrays the difficulties involved in coordinating and bringing to bear the efforts of a large number of states in an attack on the marketing problems of a commodity which has a complicated marketing system. The experience of this group indicates that the oft-criticized descriptive type of marketing study is frequently necessary as a preliminary step to the delineation of marketing problems and the development of methodology for undertaking research on them.

The paper presented by Mr. Brownlee is one of a number of studies which the Bureau of Agricultural Economics is sponsoring at universities and private research institutions. Some of us feel that problems dealing with pricing, the allocation of resources, and the over-all effectiveness of the marketing mechanism are likely to receive too little attention as compared with specific studies of particular commodities, agencies and functions. I think that Mr. Brownlee's work to date illustrates that general theoretical formulations of concepts and objectives relating to marketing efficiency may not be so difficult. However, testing hypotheses requires the making of empirical studies of particular industries, functions, and institutions which involve him in difficulties of generalizing or "adding up" which are similar to the problems many of the rest of us meet when conducting studies with more limited objectives.

Let me now mention a few points more specifically concerned with the current meaning and future effects of studies such as have been considered today.

As far as the current situation is concerned, I think that there is little doubt but that the studies under way can be completed and people will gladly receive them and read them. Even the studies which do not go beyond measuring margins will have a decided educational value. We have observed that some groups are interested in having us carry on margins and costs studies as rapidly as possible along the broadest possible front, because they expect the studies to show gross inefficiencies or exorbitant profits in the marketing of farm products. On the other hand, some middlemen and their representatives are urging that margins and costs work be expanded and speeded up for an entirely different reason. They obviously are expecting that our studies will indicate that marketing processes are not over-costly in relation to cost rates for the factors of production and methods and processes available and that profits are not unreasonably high.

When we come to future usefulness and ultimate effects of cost and margin studies, I think that we are on less certain ground, and a considerable diversity of opinion prevails. For my part, I am guardedly or conditionally optimistic. It seems to me that there are two big questions. First, is it feasible and practicable on the basis of existing conditions to make comprehensive studies of what marketing charges and costs are and what might be done to reduce them for all or most of the major agricultural

marketing industries? This is going to be a formidable task if we go into it. We are just making a start. The field is comparatively new. In some cases techniques have to be worked out as we go. Industry cooperation is a problem. All of this takes time, and yet we are being constantly urged to get quick results. Furthermore, the cost will be considerable. If we are to proceed with these studies, we must have the patience, cooperation, and support of those who are interested in research designed to provide the basis for making marketing more efficient.

The second big question, it seems to me, is: Will the results of the studies be used? That is, in the longer run, will cost and margin analyses actually result in a reduction in marketing costs? Since margins and cost research is not intended to provide the basis for government control and regulation, we must depend upon private enterprise to apply the results of research. This means that business men must be possessed of the enterprise and incentives necessary to effect the economies and make the improvements in efficiency which research research studies indicate are possible.

I believe that those who entertain the view that agricultural marketing costs can be substantially and quickly reduced for a wide range of commodities are doomed to disappointment. Consumers are demanding more and more services. I am aware that this is entirely aside from the concept of efficiency as such, which assumes that marketing services remain the same. However, the fact of the matter is that many people expect marketing research to result in an actual decline in the spread between producer and consumer. If, as it seems reasonable to believe, standards of living continue to rise, consumers can be expected to demand more rather than fewer services, and this will work against any reduction in marketing margins and costs. In fact, some of the marketing research under way at the present time, while it may be effective in demand creation, can be expected to increase rather than decrease marketing costs.

In the second place, well over half of the marketing charges for agricultural commodities are accounted for by wage payments. Wages have risen sharply in recent years and certainly cannot be expected to undergo any general decline. Not only are wages to remain high, but there is sometimes resistance to the introduction of labor-saving machinery and to changes in methods and practices because of loss of jobs for wage earners directly affected. This introduces the problem of the opposition of vested interests to changes in marketing methods and channels, which is, of course, much broader than labor and wages. This in turn brings up questions of price policy, the extent to which competition prevails, the rigidity of marketing institutions, government programs in the marketing field, etc. In my opinion, work along this line needs to be considerably expanded. It is extremely difficult, but results might be proportionately great. Research which points the way to methods, practices, processes and channels which would provide for lower costs and increased efficiency will be of little use if the institutional structure of the marketing system, price policies of private business, government programs, and related factors interfere with the application of the results of research.

The actual showing which research may be expected to make will also be related to general business conditions and price levels. It is a well-established fact that cost factors entering into marketing charges are relatively rigid and do not fluctuate in response to changes in the demand for and supply of agricultural commodities. As you know, there is a close correlation between the level of agricultural prices and the share of the consumer's dollar received by the farmer. A period of sharp decline or prolonged low prices for farm products would be certain to bring a marked decrease in the share of the consumer's dollar received by farmers, notwithstanding increases in marketing efficiency.

However, I think we are still justified in believing that studies designed to provide the basis for improving the efficiency and reducing the costs of agricultural marketing are very worthwhile. I think we are justified in believing that obtaining and disseminating the facts on marketing costs, in time, will make a significant contribution to lowering marketing costs more than otherwise would be the case.

CURRENT STATUS OF MARKETING AGREEMENTS FOR FRUITS AND VEGETABLES

S. R. SMITH

Production and Marketing Administration

THE Marketing Agreement Act of 1937 administered by the Production and Marketing Administration of the United States Department of Agriculture authorizes the use of marketing agreements and orders in handling enumerated products (including fruits and vegetables) in interstate or foreign commerce. The act has three specific objectives: To raise prices to or maintain them at parity; to protect consumers by authorizing no regulation designed to raise prices once parity levels have been reached; and to maintain minimum standards of quality and maturity.

Agreements and Orders

A marketing agreement is a contract between the Secretary of Agriculture and the handlers of any farm product. Authorized actions pursuant to agreements and orders are protected against antitrust prosecution for combination or conspiracy.

A marketing order binds all handlers operating in specified production and marketing areas to adhere to its terms. Orders may be applied to milk and its products; to fruits and vegetables, except for canning or freezing—with a few exceptions; certain nuts; tobacco; soybeans; hops; and the products of these commodities, also naval stores and honey bees. Orders applicable to fruits and vegetables may provide methods for limiting shipments by grade, size, quality, maturity, and pack in specified markets for specified periods; for allotting purchases and sales by handlers; for surplus and reserve pools; for inspection; for defining and prohibiting unfair practices or methods of competition; for selection of administrative agencies; and for such other items as are necessary to administer the order.

Both agreements and orders—except for milk, which is not discussed here—apply only to handlers and not to producers or retailers.

Formulation

The Secretary may initiate proceedings, but usually a tentative agreement and order is formulated by industry groups, submitted

for preliminary approval to the Production and Marketing Administration, and then discussed in detail at public hearings which are conducted much like courts. Upon conclusion of hearings and with time allowed for briefs and exceptions to be filed, the Assistant Administrator of the Production and Marketing Administration and the Secretary of Agriculture must both approve the proposal on the basis of evidence in the hearings record.

Agreements become effective when in the judgment of the Secretary sufficient handlers have signed them. A proposed order, which must parallel an agreement on which hearings have been held, becomes effective when the Secretary finds from the record that it will effectuate the objective of the Act; that the production area is as small as practicable; that different production and marketing conditions among different districts of the production area are recognized in different provisions; and that after submitting the order to referendum of producers, (a) it is approved by two-thirds of voting growers by number or volume of production and the parallel agreement is approved by handlers of at least half the regulated volume, or (b) handlers have not approved a parallel agreement but at least two thirds of growers by number or volume have approved the order. Additional requirements are that the order will effectuate the purposes of the act and that there are no other feasible means of accomplishing such purposes. Programs are thus formulated by the industry; proposals are carefully appraised by the Department; all interested groups have a voice at hearings and the industry approves the program.

Development of the Statute and the Programs

Only four short provisions relevant to market control were included in the Agricultural Adjustment Act of 1933; namely, (1) the Secretary could enter into agreements, the terms of which were not specified, with handlers of any farm product to control its interstate or foreign movement; (2) he could impose licenses, the terms of which were not specified, upon any or all handlers to prohibit charges or practices which prevented recovery; (3) he could require maintenance and disclosure of books and records as necessary; (4) he could avail himself of the investigatory powers of the Federal Trade Commission in inquiring into compliance. Including milk, 68 programs using licenses were formulated. Thirty programs for fruits and vegetables were developed, the production

areas being heavily localized in specialty areas on the Pacific coast and in the Southeastern States. Twenty-two programs were still operating in 1935. Nine are still operating and some of them have functioned continuously.

Experience with agreements and licenses indicated that programs should be confined to areas as small as practicable in order to maintain homogeneity of interests, to facilitate local administration, to prevent regional or Nation-wide monopoly, to eliminate problems of interregional equities, and to make adjustment to local differences in production and marketing conditions. License programs have been attacked in courts in cases which alleged failure to adhere to due process of law, incursion into intrastate trade, delegation of legislative powers without adequate administrative standards, and invalid delegation of executive authority to control committees. As a result, most of the safeguards in the present Act were introduced in 1935, such as: substitution of orders enforced by courts for licenses which could be revoked; applicability of orders to enumerated commodities only; provisions for assessment and enforcement; establishment of committees as agents of the Secretary, in whom all executive authority was vested; provision for modification, review, or exemption from findings or penalties; authorized integration with state and with other Federal programs; specification of parity price as the objective and upper limit for programs; procedure for notice and hearings; definition of commerce to be regulated; restriction of terms in orders to enumerated provisions; essential identity of an order with an agreement on which hearings had been held; careful specification of conditions for approval, effectuation, and termination.

When the processing-taxes section of the Agricultural Adjustment Act was declared unconstitutional in 1936, the market control sections could remain effective only if separated from the production phases of the act. The agreements and orders provisions were therefore separately reenacted as the Agricultural Marketing Agreement Act of 1937. In 1947, one major amendment added the maintenance of standards of quality in the public interest as one of the three objectives and thus made it possible for grade and size programs not designed to raise prices to be operated without reference to the parity standard. The act is a permanent statute independent of relief or adjustment objectives.

Use of Marketing Orders

Since 1935, orders have been promulgated for bees, cauliflower, celery, citrus fruits, grapes, hops, melons, onions, peaches, pears, plums, lettuce, peas, potatoes, fresh prunes, tomatoes, and walnuts. Forty-seven orders have been issued for 37 production areas. Nine have governed more than one commodity. Eight orders have been effectuated without a parallel marketing agreement. No marketing agreements have been made effective without a parallel order.

In early August of 1949 there were 22 fruit and vegetable programs in operation and several others were being formulated. Four cover citrus fruits, eight are for deciduous fruits, one is for vegetables, seven for potatoes, one for walnuts, and one for hops. Three programs regulated more than one commodity, which is done only when the products are related, when most growers produce more than one and when the cost of operation can be reduced. Twelve production areas are on the Pacific Coast, four in the mountain States, three in the Southeast, and three potato orders in the central States and Maine. Eleven programs include more than one state. For citrus fruits nearly the whole domestic supply is covered. Thirteen orders authorize different regulations for different parts of the production area. Thirteen permit different regulations for different varieties.

Nearly any commerce now burdens, obstructs, or affects the flow of trade among the states or with foreign nations. However, several orders restrict regulations to the United States and Canada; a few are applicable only to continental United States, Alaska, and Canada, but in general interstate and foreign trade may be controlled. Six orders provide for different regulations to different parts of the market areas. Five orders date back to 1933. Most have operated more than 10 years. One-third have been amended. Most of them have weathered a depression, a recovery, a recession, a war boom, postwar inflation, and the present readjustment. The life and stability of these programs indicate that properly formulated and applied, and well-administered, they can benefit producers without damage to other groups.

Nearly two-thirds of a billion dollars of annual production is now regulated by fruit and vegetable orders. Nine programs affected more than 5,000 producers each, the farm value of their annual production ranging from \$25,000,000 to \$90,000,000.

Administrative Agencies

The ultimate goal of producer welfare is the reason that most control committees are weighted heavily with grower representation. The need to recognize handler interests and to utilize their skills results in inclusion of handlers either as voting members or as advisers to grower committees in most programs. Final authority rests with the Secretary, to whom committees *recommend* specific regulations for clearly defined markets and periods by the methods authorized in the orders. The Secretary has broad powers. He chooses committee members from nominees selected by the industry; designates agents to act for him and all acts of committees must be approved by him or his agent to become binding; he may remove any officer; suspend or revoke any regulation; he must approve budgets and assessments; he may substitute another agency for the committees; he may suspend all or part of a program if it does not contribute to the objective of the act. Nothing in an order may limit the rights of the Secretary to intervene. As a result, no committee member is held personally liable for actions under the order except those actions involving dishonesty, willful misconduct, or gross negligence.

Thirteen orders provide for a single administrative committee although informal subcommittees may be established. Six programs provide for handler advisory committees and two orders establish district advisory committees to assist in formulating regulations, but not to vote on them. Four provide for district committees to formulate district regulations subject to disapproval by the area committee. Membership ranges from six to 25 persons. Five committees are composed of growers only. Growers are given one vote each in one district in choosing nominees. Handlers vote for handler-members either personally or by relative volume of business.

At least a full majority of the committee is required to forward a recommendation to the Secretary. Some orders require a two-thirds vote. Membership is distributed by districts and by affiliation, with a neutral member sometimes included, to prevent any single faction of an industry from controlling either affirmative or negative action.

All committees are empowered to administer the order, to investigate violations, and to recommend amendments. They are

required to mediate between growers, handlers, and the Secretary; to keep books available to the Secretary; to analyze growing and marketing conditions; to make audits; appoint employees; to give notice of meetings, regulations, and policies; and to provide information requested by the Secretary. Some committees must publish monthly statements, make crop estimates, recommend changes in election or prorate districts, announce opening and closing dates for shipping, consult with other committees, undertake research or service work, or delegate limited authority to employees. Nineteen committees must promulgate, in advance of issuing regulations, a detailed shipment policy which will permit growers and handlers to adjust their operations to the contemplated regulations. Recommended regulations must be in accord with standards set out in the order and with the advance marketing policy, valid with respect to the act and consistent with its objective and in each case supported by data and analyses. Activities of committees are further governed by requirements of the Administrative Procedure Act, Department regulations published in the Code of Federal Regulations and committee bylaws.

The Secretary may authorize committees to collect uniform assessments for expenses which are reasonable and likely to be incurred, in accordance with an advance budget approved by the Secretary. Funds may be used only for purposes authorized by the order and such uses must be approved by the Secretary. Excess funds are either credited to handlers' accounts or returned to handlers at the end of each marketing season.

Methods of Regulation

No court decisions indicate precisely the scope of regulation which may be permitted under the broad provisions of the act. Many different methods have been used, but most of them may be classified within a few major types, namely: (a) *Regulation of quality*. This is usually accomplished by specifying the grades and sizes of the product which may be shipped to market. (b) *Regulation of quantity*. This method of regulation involves the establishment of the quantity of the product which may be shipped to market during any specified period. The total quantity is allocated among all handlers on the basis either of past performance of handlers or the amount of product each handler has available for

current shipment. (c) *Reserve pools*. This involves the establishment of a reserve pool of the product, and the equitable distribution of returns derived from the sale thereof. (d) *Surplus control*. This involves determining the extent of a surplus, providing for the control and disposition thereof, and equalizing the burden of surplus elimination among producers and handlers. (e) *Unfair trade practices*. A method may be provided for prohibiting unfair methods of competition and unfair trade practices in the handling of agricultural commodities. (f) *Price posting*. This involves the requirement that handlers file their selling prices, and such handlers are not permitted to sell at prices lower than such prices as filed. Handler may change the prices at any time, but adequate notice must be given thereof.

Limitation of shipments to particular grades and sizes has been authorized in 30 programs and 13 have provided for minimum standards. Two each have authorized limitation by grade only or by size only. Two each have provided for minimum quality and for minimum maturity and one has specified pack requirements. Seven have authorized control over rate of flow to market, two of these specifying daily control and four authorizing shipping or loading holidays. Six orders have provided for diversion to secondary outlets. One program provided for price posting, and two have defined and prohibited unfair practices and methods of competition.

Trade channels, trade areas, or outlets other than those specified are exempted from regulation. Fruits and vegetables for canning or freezing cannot be regulated by Federal orders, except for asparagus and olives. Charity, relief, express, parcel post, and minimum-volume shipments are usually exempted.

All orders require reports as requested by the committee or Secretary in order to check compliance, the fulfillment of the objectives of the Act, and the degree to which antitrust exemption is abused. Most of them require manifest reports with detailed information on each shipment. Standard forms are provided and the extent and frequency of reporting are minimized. Confidential matter is carefully protected against disclosure, by the law, by the terms of the orders, and by the regulations of the Department.

Enforcement

Three methods are authorized in the act: Civil damages triple

the value of overshipment; restraining orders or injunctions; fines of \$50 to \$500 after conviction in a criminal action. Most cases in recent years are outright violations and the infrequent fruit and vegetable action is usually prosecuted under the criminal-penalty section. Any handler may petition for relief from any order or regulation. While the petition is pending, he is protected against criminal prosecution. Procedure is outlined in detail for handling such petitions and for appeal to the courts from the decision of the Secretary. The agreements and orders programs are protected against whimsical or capricious administration by any person at all stages from formulation through the issuance of regulations by the Secretary.

Procedure for amendment is much the same as for formulation, except that less time for notice may be required.

All, or any provision, of an order must be terminated if the Secretary finds that it does not contribute toward the objective of the act. No regulation designed to raise prices above parity can be issued. On petition of producers of at least 50 percent of regulated volume, the Secretary must terminate the program at the end of the current season. Benefits, privileges, and immunities terminate then, except for acts committed during the operation of the programs. The administrative committees become trustees and liquidate the assets of terminated programs.

Summary

Agreements bind only signers and therefore are not effectuated unless parallel orders binding on all handlers are issued. Procedure for operations from initiation through formulation, effectuation, and issuance of regulation are specified in detail in law and in published regulations. Orders are applicable only to specified commodities and channels of sale. They may contain terms which have been used mostly for limitation of shipments to particular grades and sizes; minimum standards; rate of flow control; and surplus or diversion control. Agreements are effective as declared by the Secretary. Orders must be approved by the large majority of growers and usually by handlers. More than 60 programs have been effectuated since 1933. Twenty-two orders now govern marketing of an annual output of fruits and vegetables valued at about \$650,-000,000. Grade-size control is most frequently used since it is equitable, easy to administer, and effective. Exemption clauses

prevent hardship to individuals or regions. Except for two western citrus industries, rate of flow control is used as an auxiliary to grade-size regulation. This method requires careful proration and provision for adjustment of allotment. Surplus control devices are used mainly for such products as nuts and hops. In general, the long life of these programs indicates that they are effective—when properly applied and administrated—in maintaining and establishing incomes to growers in the interests of the general welfare.

FLORIDA CITRUS AGREEMENT

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A DISCUSSION of the Florida Citrus Agreement should be prefaced with a brief account of the operations of the Florida Citrus Growers' Clearing House Association, because the pattern of government regulations was foreshadowed by this organization. The Florida Citrus Growers' Clearing House Association was incorporated under the cooperative statute of Florida and conformed to the Capper-Volstead Act. Federal and state agricultural workers, commercial people from within and outside the state, and growers all had a hand in its organization. However, as early as 1888, long before people outside the state became interested in the Clearing House idea, and from time to time after this date, the *Proceedings of the Florida Horticulture Society* refers to the desirability of a citrus czar, or an over-all organization, or some government program that would enable the industry to control itself. The objectives of the Florida Citrus Growers' Clearing House Association were:

1. Standardizing of grade and pack.
2. Prohibit movement in interstate commerce of poor grades and sizes.
3. Regulate weekly shipments to insure an orderly time distribution.
4. Regulate shipments to auction markets to insure an orderly place distribution.
5. Advertise.
6. Minimum prices or a floor under prices which would at least return cost of production to efficient producers.

The standardization of grade and pack program accomplished much and a good beginning was made in advertising.

Regulation of shipments to market and proration to auction markets failed for three reasons. First, those firms outside the Clearing House nullified the efforts of those firms in the Clearing House by increasing their shipments when the Clearing House decreased the shipments of its members. During one allotment period the 20 percent outside the Clearing House shipped 50 percent of the fruit. Second, when the non-members persisted in overshipping, members began to violate their allotments because they felt that they were left holding the bag for the non-members. Third, no equitable method of making allotments was ever developed.

The Clearing House never marketed or had direct control over a box of fruit. It attempted to achieve its objective by controlling the marketing firms.

Although at one time 80 percent of the Florida citrus crop was handled by firms affiliated with the Clearing House, it was short lived, operating from the beginning of the 1928-29 season to the Fall of 1933.

When Federal statute provided for a means of bringing the entire industry under control it was immediately endorsed by those who had supported the Clearing House movement as a method of accomplishing, with Federal law, what the industry for four years had failed to do on a voluntary basis.

On May 8, 1936, Marketing Agreement No. 64 became effective. This agreement provided for regulation of weekly shipments and grade and size restrictions. No provision was made for proration to auction as was the case in License No. 95. The basis of making allotments was changed from past performance to an option of past performance or current control. This agreement was thrown out by Federal Court order in 1937 after operating less than a season.

Order No. 33 Covering Florida Citrus Fruit

Since February 22, 1939, the Florida citrus industry has been covered by Federal Order No. 33, which is a grade and size regulation. The experience of two agreements providing for regulation of weekly shipment had convinced Federal authorities that conditions in the industry were not conducive to a volume regulation. Because many growers will not enter into an agreement with marketing firms to handle their crop before the season opens there is no way of making allotments on the basis of current control. Federal authorities have, I believe, held to the opinion that there has not been an equitable method of making allotments, except on the basis of current control. It is of interest that Order No. 33 dropped both weekly volume regulation and auction prorate, leaving only grade and size regulations. However, in 1946 the order was amended to provide for shipping holidays during the period December 20 to January 20. But no more than two holiday regulation periods may be instituted in a season and then for not more than a total of fourteen days. By this amendment a step back to the regulation of volume was taken, although it was rather minor. The shipping

holiday is of questionable value. If the trade anticipates a holiday regulation, they are likely to buy enough supplies to carry them through the holiday.

Since the order became effective, a period of little over 10 years, there has been 168 orange, 159 temple orange, 114 grapefruit and 84 tangerine grade and size regulations instituted. In addition, there have been four or five periods when all shipments of certain varieties were prohibited.

Regulations have varied in length from a few days to several weeks and have averaged about two weeks. Some regulations have been very restrictive prohibiting perhaps for some marketing periods 25 to 40 percent of the fruit harvested from moving to the market. Other regulations have restricted only a very small percent of the crop from moving.

The order is administered by eight growers, composing the Growers' Administrative Committee and eight shippers, composing the Shippers' Advisory Committee. Members of these committees are nominated by the industry and appointed by the Secretary.

Benefits of the Program

One of the objectives of the program has been to maintain a uniform high grade of product on the fresh market. It is the general opinion of the industry, in which I concur, that considerable has been accomplished in this field. Certainly some low grade fruit has been kept off the fresh market and diverted to the processed market. It does not follow that the processed product has been hurt as a result of this, because citrus fruits which are considered poor quality for the fresh market may be very good quality for processing purposes. A second benefit of the agreement has been that of excluding any grade or size fruit when the committee believed it would return red ink to growers. This relieves to some extent the burden of marketing cost placed on good grade fruit by tie-in sales when poor grades return red ink. Because growers object to close grading, which increases the cull pile, and because of the necessity of obtaining large volume for economic operations, any account sale handler is apt, perhaps unconsciously, to resort to the practice of tie-in sales.

Another benefit is the development of statistics which the industry needs in its operations. Statistics obtained for developing its marketing agreement policy are the only authentic data available

which indicates the quality of the crop at the beginning of the season. Throughout the season data are compiled by weeks which show prices by sizes and grades.

An important benefit of the program is the bringing together from time to time representatives of growers and shippers to study the marketing problems of the industry. These committees have gained considerable prestige which make them important factors in steering the industry along practical lines. This benefit is more far reaching than the interchange of ideas between the two committees and their alternates. Anyone in the industry may be heard while the committee is in session, or, as often is the case, industry people express their views to their committee representative before action is taken. Perhaps the greatest educational value comes from the contact of industry people with their committee representative. Here committee members pass on to the laymen the thinking and reasoning of the committee. When education is tied to price or profit as is the case here, it speeds up the learning process.

The benefit from the study of industry marketing problems is of course centered in the formulation of a marketing policy to be followed during the season. In some cases committee members are inclined to leave too much of this to the manager. The members should devote more of their own time in developing this marketing policy. In addition to the marketing policy formulated at the beginning of the season, marketing problems must be continually studied in light of ever changing conditions before recommendation for regulations are made. This necessarily requires a study of past regulations and an appraisal of the current regulations. A desirable feature of the Florida agreement is that regulations are subject to change upon the recommendation of the committees.

Changing Conditions in the Industry

Three marked changes have taken place in the citrus industry since the order regulating Florida citrus was instituted in 1939. First, Florida grapefruit production has doubled and orange production has more than doubled. Second, there has been a large increase in the percent of the orange crop processed. In 1939-40 season, only 13 percent of the oranges were processed, in 1947-48 season 50 percent were processed. It is believed that two-thirds to three-fourths of the crop may soon be processed. Apparently there will be frozen concentrate capacity in the state to handle 20,000,000

boxes of oranges, or one-third of the crop this year. Canners have capacity enough to easily handle a third of the crop. This change in the form in which fruit is being marketed is particularly significant since the present marketing agreement does not cover processors. Should 75 or 80 percent of the fruit go to market in processed form it may reverse the customary packing house operation. It is possible that with 75 percent of the fruit going to the processed market the fruit for the fresh market will be sorted out from the processed fruit at the processing plant. The third condition is the rapid rise and decline of the Texas industry, which may be temporary, and the failure of the California industry to hold the dominant place which it held for over 50 years.

Agreement Still Effective

It is usually assumed that the most effective regulations under Order 33 are those covering tangerines. The reason for this assumption is that Florida has no competitors in tangerines and any restriction of undesirable grades or sizes on the part of the Florida industry will not be replaced by additional supplies of low grades and poor sizes from other areas. In addition, a small percent of the tangerines are processed, hence those tangerines restricted by regulation do not later appear on the market in processed form to compete with the fresh product. While these two things are true this should not necessarily mean that benefit from orange or grapefruit regulation may not be fully as profitable as tangerines. Where regulations are highly restrictive as when a large part of the product is diverted to processed form, it makes possible confining to the fresh market only the high quality part of the crop. This should aid in making advertising more effective and simplify the marketing operation because handling many grades and sizes is expensive and may be confusing to consumers. The process does not go so far as to not allow consumers a choice. Where a regulation is carried to this point, a part of the fresh market may be lost. Actually, before we can know that our regulations are on firm ground, additional research is needed in the over-all field of demand, particularly at the retail level.

It has been suggested that in addition to regulations the program serves a useful purpose in that it supplies a great deal of useful statistical data and is a basis of stimulating study by industry people of their marketing problems.

The Florida citrus industry, in general, is decidedly of the opinion that the present program is serving a useful purpose through its grade and size regulations, but, at the same time, it is convinced that the program is not adequate. Certainly a sizeable part of the industry believes that weekly volume regulations, with proration to auction markets, are desirable. A considerable segment of the industry believes that processors also should be controlled, although, it is difficult to advance a good reason for controlling processors where only grade and sizes are regulated. Those who advocate bringing the processor under the program are usually thinking of a program that would provide for allotments of oranges to certain uses such as fresh use, processed use, and possibly for cow feed. But with the rapid changes taking place in the processing field this would be a mistake.

If a method could be developed for maintaining equity between handlers with volume regulation it would be almost universally accepted. Notwithstanding the failures of volume regulation in the past, once without government participation, and twice with government participation, the citrus industry, for over a year, has been perfecting an organization (Florida Citrus Mutual) under which it hopes to achieve, among other things, volume regulation.

According to a press report of July 23, 1949, Florida Citrus Mutual intends to institute a program of volume regulations as well as some other activities which if not identical with the activities of the old Clearing House are very similar to them. The program for the 1949-50 season as announced by the board of directors is:

1. "Establish minimum prices for fruit utilized by canning and concentrate plants.
2. "Regulation of volume of fresh fruit shipments, with weekly allotments to shippers on a past performance basis, adjusted as crop conditions may warrant.
3. "Establishment of minimum price on F.O.B. sales of fresh fruit whenever such minimum prices are necessary to stabilize marketing conditions and to achieve a more orderly distribution.
4. "Allotment of fresh fruit shipments to metropolitan areas, whenever such allotment becomes necessary with allotments to shipper, recognizing their historical position in such markets."

Florida Citrus Mutual is reported to have 80 percent of the fruit under contract for 1949-50 season.

Among the directors of Florida Citrus Mutual are people who

have served on the administrative committees of Order 33 and others who were closely affiliated with the activities of the Florida Citrus Growers' Clearing House Association. At least some of these directors are aware that the week-to-week shipments of Florida oranges over a period of years have not deviated from the average any more than the weekly shipments have from California. In the face of all the evidence about volume regulation and the experience of the past, the Florida citrus industry believes that something should be done about controlling the industry in addition to grade and size regulation.

The activities of the Florida Citrus Growers' Clearing House Association and the plans of Florida Citrus Mutual have been injected in this discussion to show the interest the industry has in industry programs. Most industry people feel that certain controls are necessary. They would prefer to have these controls without government participation, but most commodity controls are ineffective unless there is complete industry concurrence, rarely achieved without government participation.

Industry people are also inclined to rely on a governmental program or programs to cure all their ills. The biggest problem that an individual grower or individual firm has is meeting the competition of his neighbors. Likewise the biggest problem that one segment of an industry has is the meeting of the competition of other areas. Government programs should not attempt, through subsidy or otherwise, to eliminate this competitive element in our economy.

MAINE POTATO MARKETING AGREEMENT AND ORDER

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THE Maine Agreement No. 108 and Order No. 87 became effective November 15, 1948 and continued until June 30, 1949. Establishment of the agreement and order followed the usual procedure outlined by the Secretary of Agriculture. The program in Maine covered the entire state rather than any area or areas of concentrated production of potatoes. Over 90 percent of the handlers of this commodity voted for its adoption.

Specifically the marketing agreement and order stated that no handler of potatoes could ship any table stock potatoes of a variety or varieties of potatoes other than the Bliss Triumph variety, unless such potatoes met the requirements of U.S. No. 1 or better grade, and were not less than $2\frac{1}{4}$ inches nor more than 4 inches in diameter. The foregoing limitations on shipments of Maine table stock potatoes were not applicable to shipments of potatoes for export, or shipments in connection with government price support programs.

The order was administered by a committee of eight members, consisting of five producers and three shippers or handlers of potatoes. An equal number of alternate members were selected and served when regular members could not attend. The members and alternates were selected to represent each important potato production area in the state. The term of office of each member and alternate was one year. The duties of this committee were to serve as intermediary between the Secretary of Agriculture and any producer or handler of potatoes in carrying out the marketing agreement and order. Assessments were made against all rail and truck shipments to defray the expense of carrying out this program. All assessments above actual expenditures were refunded or credited on a prorata basis to all handlers. This meant keeping separate assessment accounts for nearly 2,000 handlers of potatoes.

The program in Maine started with very little opposition. There were only seven handlers who took active opposition to the program, some of whom were also growers. In mid-marketing season, about February, all the handlers had withdrawn their respective

petitions and requested dismissal of their cases. Thus the program was received and carried out with little opposition.

One year's experience with the potato marketing agreement and order in Maine is insufficient to draw definite and final conclusions. However, the past season's experience furnishes some indication of the desirable and undesirable features of such a program.

Desirable Features

The primary objective of this program was to supply the markets with potatoes of good quality and size. The size restriction for potatoes is considered a very desirable feature of last year's marketing program. However, more information is needed, both as to what sizes of potatoes consumers will buy at various prices, under various economic conditions when given a choice of purchase, and also the relative proportion of the potato crop falling within various size ranges over a period of years.¹

Also, it may be considered an advantage to the industry if the potatoes shipped to the market are of U.S. No. 1 grade or better. In recent studies of potato quality, the Maine Station² has found potatoes with grade defects in several markets far in excess of the tolerances allowed for U.S. No. 1 grade. Thus, a marketing agreement and order might help improve the quality of potatoes on the markets. However, to accomplish this requires careful grading and inspection of all potatoes. It automatically makes these two operations compulsory on the part of the handler. The compulsory phase may be considered a desirable or an undesirable feature.

Another advantage which is perhaps a complement to shipping only U.S. No. 1 quality or better is to encourage the consumption of more potatoes.

The shipment of only U.S. No. 1 quality potatoes or better with a somewhat narrower size range theoretically should encourage better handling of potatoes through the various marketing channels. Also, with a more uniform product of somewhat better quality the handling charges from the shipping areas to consumers should be slightly less, due to smaller losses and possibly to some increase in volume of sales.

¹ Merchant, Charles H. *Consumers' Acceptance of Sized Potatoes*, Me. Agr. Exp. Sta. Bul. 465. December 1948.

² Merchant, Charles H. and Woodward, Homer C. *Quality of Potatoes in Retail Stores in Boston, Mass. and Maine Markets, 1948*. Me. Agr. Exp. Sta. Bul. 466, February 1949.

Undesirable Features of the Marketing Agreement and Order

As commonly known, there is considerable range in the quality of potatoes which can be certified as U.S. No. 1. Under the marketing agreement and order it is often to the financial advantage of a grower or shipper to crowd the tolerance permitted under U.S. No. 1 standards. This is especially significant where the price differential is large between U.S. No. 1 potatoes and those of lower grades. This represents a real problem in grades and shipping-point inspection work. When shippers are crowding the tolerances allowed under U.S. No. 1 they are also encouraging lenient shipping-point inspection. Both of these are undesirable.

Closely associated with the quality problem is that of the cost involved in the grading and shipping-point inspection of potatoes. Inspection costs is an added expense to nearly all shippers, as normally inspection is not called for on all shipments. This additional cost to many central and southern Maine producers was rather burdensome where they marketed small quantities at a time in nearby markets.

For a marketing agreement and order to be successful satisfactory market outlets must be available for grades of potatoes not coming under the order. Unless the returns for the grades not permitted under the order are in line with U.S. No. 1 quality, growers and shippers are going to crowd the tolerances on all potatoes sold under the marketing agreement. In an area like central and southern Maine there are inadequate outlets for these poorer grades of potatoes. In these sections there were many more violations in proportion to the volume of potatoes handled than in the concentrated production area of Aroostook County.

Another disadvantage associated with the marketing agreement and order is that the consumer is left out of the picture entirely. Little or no attempt is made to find out what qualities are most desired. Some consumers have a preference for good quality, small size tubers. If they are unable to purchase the quality preferred they may reduce their consumption of potatoes.

Truck shipments of potatoes make the control problem much more difficult.

Under the provisions of the marketing agreement and order, certain exemptions can be made. Care must be taken that these exemptions do not become the rule, and the marketing order no longer function. This is an administrative problem requiring unusual skill for successful operation under certain conditions.

ELEMENTARY ECONOMIC THEORY OF MARKETING CONTROL

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THE major objective of this paper is to determine the degree to which available theoretical concepts are used as a basis for control policy. Most administrative committees operating under the Agricultural Marketing Agreement Act of 1937 seem to be seeking maximization of long-run returns to growers. They appear to be motivated by a complex of goals. They are not free of many of the legal or other institutional constraints inhibiting the degree to which income can be maximized or the methods which may be used by private firms. Committees know that to maximize money returns in any outlet will often lower possible maxima in other outlets or times; that heavy plantings may be induced; that the enabling statute prescribes a maximum of parity prices; and that where profit-maximization prices—which to individual firms stand as marginal revenue with respect to output—greatly exceed the marginal costs of shipping at allotted volumes, there will be universal and powerful temptation to overship allotments or to move prohibited grades, sizes, maturities or packs by individual shippers still conscious of individual competitive identities. The goals of administrative committees appear to be no different from those governing policies of non-agricultural agencies large enough to manipulate one or more profit determinants in addition to their own costs of production. To formulate shipping policy or to use theory there must be a routine in the relations among long-run profit determinants, sufficiently simple to serve as the basis for regular and systematic manipulation of one or more profit-determinants.

Net income to participating shippers could conceivably be increased through lowering costs of production or through monopsonistic pressures on prices of resources used. Joint action in production processes is not authorized. Factor costs are rarely if ever manipulated. Market control in practice means the manipulation of selling prices or of demands. For effective operation, every market control agency must achieve sufficient power over one or a few determinants of selling price to change the industry into a single firm with respect to the controlled price determinants. Except for

indirect effects upon production and procurement activities, other price determinants are unaffected.

Administrative committees are typically faced with a variety of specific questions: how much should be sold in all outlets over the season; what methods of limitation should be used; how should shipping rights be allotted; how should sales be allocated over alternative outlets; what are the optimum proportions by grade, size, maturity or pack; what time distribution will contribute most to the long-run profit goal? There is another set of questions relevant to groups other than growers: how do various regulations affect the volume of business and operating margins for handlers in current and subsequent seasons; what happens to demand levels in other outlets or subsequent periods; what happens to volume of production of the regulated good in the regulated area or in competing areas; how is the output of competing goods affected; what happens to volume of consumption and the proportion of income required to command such consumption in total and by special classes if price discrimination is used? One test of the usefulness of theory is the degree to which methods for answering such questions are suggested.

Methods of Income Enhancement

Federal orders seek to increase incomes through manipulating total receipts and not by decreasing costs. They provide for adjustments to given demands and for manipulating demands through central control over timing, constituency or allocation of sales. Product variation, intended to decrease substitution elasticities and thus to protect against lowered prices of competing goods, can be achieved only through grade-size controls. No direct advertising or other measures intended to lift demand levels may be used. The economic theory of federal marketing control is thus much simpler than that of state programs which may authorize joint control over the production function, factor-costs and both product variation and demand manipulation in addition to the techniques used in federal agreements and orders.

To achieve price or demand control, shipping authority over all or a large part of industry output must be centralized in a single agency. This can be done by cooperative marketing, amalgamation, product differentiation by large handlers or by agreements and orders. Prices can be manipulated in many ways. Product differentiation may decrease substitution elasticities and the size of market.

Advertising may lift demand. Increased buying power will raise some demands. Weather clearly affects some prices. Volume, time and space distribution and freedom of wholesale receivers from fear of unexpected gluts will affect season average price. Allocations over alternative outlets will partly determine season average price and thereby season income for multiple-purpose products. Grade-size proportions affect level of demand as well as price. The net relations of these factors to price are often fairly well known.

Prices varying with unknown factors, unsystematically, without stability or with such uncontrollable variables as weather, buying power, output of competing goods and perhaps over-all quality cannot be manipulated by joint action of growers or handlers. But within broad limits, other factors can be so controlled and net income thereby enhanced. To use most of these devices, two conditions are necessary: all handlers must participate; violations must be prevented. The techniques for such control may be classified into three groups: limitation, where the supply sold in any outlet or time is less than that which would move where shippers operated atomistically; diversion, where proportions sold in alternative outlets are different from those which would result from atomistic sale; and demand manipulation, where levels of demand are raised or maintained by control over timing, grade-size composition, spatial distribution or pack. So long as there are depressions, irregular outputs per acre of the regulated or competing goods and irregularity in other determinants of seasonal demands, there will be seasons in which demand elasticity for produced supplies is very low at the field level for industries which are well adjusted to long-run demand prospects. Under these circumstances, only marketings and not production can be controlled. For effective marketing control, all firms must take part and the temptation to violate allotments must be restrained.¹

In a competitive industry, shipments will be continued until

¹ Limitation programs are not always confined to emergency years when demands fall or yields rise. Capital—or acreage—may have become too large in face of the long-run demand outlook. At best, limitation eases liquidation through bankruptcy and revaluation of assets or through tree or vine pulling. At worst, it prevents effectuation of these adjustments which alone touch the fundamental problem. It is always difficult to know when capital is redundant—as in 1929–1939 for many industries now prosperous and presently for industries which have lost regular export outlets. Should trees and vines be pulled, requiring years of gestation if demand again rises; or should such industries limit sales and maintain productive capacity in the hope that political differences and war wounds will be healed?

the expected average price at terminal falls to equality with realized average costs of harvesting, packing, shipping and marketing—or when field price falls to zero and there is no contribution to production or capital costs whatever. If—when demand falls or yields rise or even when an industry is just too large for its demand—sale of full production would reduce field returns to zero, there can be no successful or enduring limitation of marketing without full industry participation. With such full participation and with effective enforcement, field price may be raised by many methods towards but not to the monopoly equilibrium. Such control will always be unstable because price—which is effectively marginal revenue with respect to output for a concern still competitive in all of its production and procurement and in most of its selling activities—will always exceed the marginal cost of marketing at the quantity allotted to the individual. Thus the decisions of a control agency must have the full effect of law.

In the short run at least, limitation will always involve hostility of interest between growers and groups of handlers, processors or consumers.

Where only part of an industry participates in a program, limitation will always lift group returns but by less than were all handlers to participate. There will be two inducements to violate allotted shipping rights: realized price will exceed marginal shipping costs at allotted volumes for all individuals; outsiders will obtain a higher price as a result of limitation by participants and will also move a larger volume than they would without limitation.

The effects of limitation cannot be measured unequivocally and for many of them, economic theory does not indicate either the data which must be obtained or the calculations which must be made in order to obtain answers. Limitation effectively translates a competitive industry into a monopolistic firm with respect to a very few price determinants but leaves most selling and all production and procurement activities unaffected. Marketing cooperation also means that with respect to some cost and price determinants, all or part of an industry becomes a single firm. However, the industry formulates its own program and it is not effective unless large majorities favor effectuation. No limitation program can long endure if there is an unregulated minority willing to capitalize upon restraints by other shippers while remaining free of any obligation to limit sales. No complete monopoly is ever created by these

programs even in the few profit determinants which are controlled. There is no indication in the many years of operation of these programs that the competitive alacrity, self-respect or entrepreneurial independence of growers and handlers is diminished. In view of the proper applicability of limitation programs to emergency situations in well-adjusted industries and the checks inherent in their prolonged use, it is doubtful that resource distribution is much distorted from the competitive norms. If limitation programs are effectively used in the two problems for which they are designed, they will in fact tend to prevent the deviation from competitive norms which result from the physical attributes of production, the small scale of output and the organization of marketing in fruits and vegetables.

Limitation raises aggregate net income by raising sales price in ranges of inelastic demand and by saving cost outlays in marketing the quantities which would be moved in the absence of control. Such limitation is not immediately desirable from the standpoint of any other group. However, the scale of operation, the rigidity of marketing costs, the physical characteristics of production and the inability quickly to adjust output, the sudden and uncontrollable deviations both in demand and in output and the organization of markets differentiate the produce industries from other parts of the economy. Limitation will always reduce the amount of goods consumed and thereby will damage consumer interests, although total consumer expenditures may also fall and some income classes may be clearly benefited if limitation is associated with price discrimination. The maximum possible transfer of income from processors, handlers or consumers to growers, is as discussed above, not often attempted. These groups may be benefited over the long run if controls maintain productive acreage which is economically profitable in face of long run demands but which would be destroyed because growers acting alone could adjust neither marketing nor production as demand changed or as yields per acre varied in a series of several seasons. With uncertainty of future demand, short-run transfers of income which facilitate maintenance of capital plant may not be hostile to long-run public interest. While the bankruptcy process would benefit other groups in the short-run, such gains in the form of more and cheaper foods and raw products might be more than countered by the relief costs associated with general business failure. The major danger lies in the abuse of

limitation to prevent desirable contraction in industries which are too large. Further, exaction of maximum possible profit in any season may damage growers through depression of demand levels in subsequent seasons and by inducing increased plantings of the limited product and its competitors.

The major issue here is the alternative to limitation. If, without intervention, field price fell to zero and crops still lay unharvested, the costs of bankruptcy and relief would necessarily be incurred. Production control aimed at profit maximization would involve more stringent output control and higher prices with even greater transfers to growers than would limitation. Depending upon the support percentage and the level of parity, support prices could involve even more limitation and would unquestionably lead to production controls if prolonged. Compensatory payments with markets cleared would cost more to government than would price support whether with destruction, gift, diversion or storage. Such payments with storage may involve least cost to government and consumers if demand recovers fairly rapidly. Perishable crops with low demand elasticities cannot be stored effectively. Marketing agreements and orders will ordinarily mean less restriction of output and less cost to government than will production control or price-supports and compensatory payments when demand elasticity and demand levels are unusually low and support is calculated from a parity price based on years when demand was relatively high.

Diversion Programs

Where outlets are separable and leakage can be prevented, discriminatory pricing will yield higher returns to the group than would uniform monopoly pricing. Limitation in major outlets frequently requires control over other channels. Violations will be induced both by the fact that realized prices exceed marginal shipping costs and because price differentials induce handlers to buy low and sell high where such differentials exceed the cost of transfer between discriminated markets. Without central control, atomistic shipping patterns will lead to equalization of field prices in all outlets. No generalizations may be made with respect to effects upon consumers since different classes are involved.

In limitation and diversion programs for staple crops and in markets substantially meeting the independence assumption, static theory lays out clearly the data which must be obtained and the

principles which must be applied in order to benefit growers. It also specifies major dangers to growers and indicates the divergences of interest which may be expected. But neither here nor elsewhere are there theoretical techniques which effectively indicate the impact of such programs in welfare terms.

Interrelated Demands

Intra-seasonal programs are mainly intended to prevent glutting in one or a few outlets and its spread to other outlets. There are three main types of such controls: rate of flow where time periods are interrelated; grade and size limitation; and minimum standards of quality, maturity or pack.

Markets may be glutted because small-scale handlers who are distant from markets react simultaneously and alike in accelerating shipments in response to market opportunities, high holding costs or prospects of heavy shipments later in the season. But if all react similarly, expected prices may not be realized and actual field price may be reduced below zero. No order can eliminate the risk of demand changes over the transit period. Marketing orders eliminate the risk facing wholesale receivers that unforeseen acceleration of arrivals may occur. Price-falls at wholesale do not seem to accelerate retail purchasing until retail stocks are cleared. The effects of the glut may therefore cumulate over time. Few facts on such interrelations are available but the interest of the wholesaler in margin rather than price makes such occurrences consistent with efforts of producers and wholesalers each to protect against unforeseen changes in price or condition of products. Except to indicate that total sales may be increased and total receipts to growers may be enhanced without loss to receivers for whom a major risk is eliminated and with no loss to consumers who may obtain a more desirable pattern of purchases, theory does not indicate maximization adjustments or their effects in temporally interrelated markets. Actually, rate of flow control may be intended to reduce wholesale market risks and by reducing marketing costs, raise grower returns. Thus far, no facts are available to form hypotheses.

Grade and size limitations have two declared purposes. First, heavy sales of some grades or sizes may bring losses. Second, there is evidence that flooding of one or more grades and sizes may reduce the level of demand in substitute classes if differentials become unusually large. Again no theory sets out optimum distribution prescriptions where demands for various grades and sizes are re-

lated. It appears that no damage is done to other groups when growers maintain the value of aggregate output by controlling the grade-size constituency of the sales in related markets.

Minimum standards of grade, size, pack or maturity have much the same objective. In response to individual opportunity or compulsion, handlers may increase their own returns by selling low quality or poorly packed products. They may thereby lower the demand for all classes of the commodity. Again there are little data on the effects of sales of low grade, small size or poorly packed products upon demand for other packs or grades and sizes.

Summary

Administrative agencies in marketing agreements and order programs apparently seek a price and profit goal consistent with long-run stability of income. Relatively few techniques of control are authorized. Production and procurement efficiencies are not sought through federal market control. Only the amount, the grade or size, the time or place distribution and the minimum standards of shipments may be controlled. Useful theory should set out the conditions for maximization and provide means to assess the impact of various programs upon growers, handlers, processors and consumers. Federal programs are intended in the main to make possible a monopoly-like adjustment to demands or to manipulate demands by control of sales in related outlets. Individual firms therefore lose little of their competitive identity and may increase their incomes by differential skills or scale in producing, procuring supplies or factors, in differentiating their products, in sales promotion and in nearly all merchandising activities. Only one or a few price determinants are centrally manipulated. Programs involving limitation may be analyzed effectively in terms of available theory. Diversion programs involving price discrimination may also be handled effectively. Programs involving rate of flow control, grade-size or other related factors and minimum standards cannot be analyzed in terms of existing static theory. No useful theory of related demands is yet available. The facts of market organization and operation on which such theory could be based are not determined. Few control boards—or anybody else—could unequivocally predict the effects of manipulating any short-run price determinant in one market, in several independent markets and especially in interdependent markets.

THE DEVELOPMENT OF BASIC DATA UNDER THE RESEARCH AND MARKETING ACT

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AMONG all progressive and intelligent peoples of the earth, the quest for more and better information of all kinds goes forward year after year. This is as it should be, for "genus homo" still has a long road to travel to attain the perfection of complete knowledge and understanding of mankind, to reap the fruits and complete fulfillment of man's productive activities, and to find the answer or "reason why" for all things material or spiritual. From the earliest records of man on earth, there are several indications of the use and importance of basic data. The Mandarins of old China and the Pharaohs of Egypt recorded production of food, fibre, and livestock, and used these basic data in formulating plans for future agricultural development.

Among primitive people, however, the fight for survival was usually so important that hoarding of some food was about the only exercise given the grey matter of these pugnacious ancestors. During the colonization of our country very few records of crop acreage or production are found before the Revolution, and little desire on the part of farmers for state and national crop reports during the first third of the 18th century. Letters and reports from our earliest Presidents, principally Washington and Jefferson, indicated their belief in and use of basic data and other information concerning farming operations at Mount Vernon and Monticello. In 1839, Congress made the initial appropriation of \$1000 for distribution of seeds to farmers and for collection of agricultural statistics.

During the 110 years that followed, work on basic data and related information for farm products, although it has expanded remarkably, has not developed in proportion to the increases in population, wealth, and complexities of our national agriculture. There is still a material lack of the basic production and marketing data needed for many phases of the agricultural program, both on a state and national basis. The United States Department of Agriculture, through its Bureau of Agricultural Economics, has scientists and technicians who are fully capable of expanding coverage and leading the work of collecting basic data, but facilities have

been lacking for anything like the complete job these newer marketing studies and developments demand. Since World War II many marketing problems have been centered in specific regions, states, or counties. Demands for fundamental facts increase rapidly as unstable economic conditions threaten any local agricultural industry.

These facts were recognized by Congress in a general way when preparing and passing the Research and Marketing Act of 1946. Section 203 of Title II of this act states in part, "The Secretary of Agriculture is directed and authorized to collect, tabulate, and disseminate statistics on marketing agricultural products, including, but not restricted to statistics on market supplies, storage stocks, quantity, quality, and condition of such products in various positions in the marketing channel, utilization of such products, and shipments and unloads thereof." Section 204 states, "The Secretary of Agriculture is authorized to make available from such funds such sums as he may deem appropriate for allotment to State Departments of Agriculture, State bureaus and departments of markets, State agricultural experiment stations, and other appropriate State agencies for cooperative projects in marketing service and marketing research to effectuate the purposes of Title II of this Act."

The Act apparently provides both a mandate and an opportunity to agriculture to get its research and marketing machinery in better order. Initial response to provisions of the Act has necessarily been slow, as its enabling features have required testing and experience. Also, it has taken about three years for many state, federal, and independent agencies to fully understand RMA provisions and to set up matching funds so projects could be submitted for approval. In his discussion of a paper titled "State Frontiers in Agricultural Statistics" presented by Arnold P. Benson at the September 13, 1948, meeting of the American Farm Economics Association, R. K. Smith indicated that nine states had cooperative RMA projects in operation that were developing primary statistics and related basic data for fruits, vegetables, hogs, poultry, milk, grain storage, alfalfa dehydrating plants, and prices received by farmers. Mainly, emphasis on all of these has been placed on the development of data for areas smaller than the state, complete enumerations or sample surveys of acreage and tree numbers, monthly prices, and monthly marketings.

Today, cooperative RMA projects of this type have been widely

extended. Allotment of matching RMA Title II funds, for developing new basic information to improve marketing services, facilities, and outlets, are negotiated through the Production and Marketing Administration. The approved programs are carried out under cooperative agreement between that Administration and the State Departments of Agriculture, the State Bureau of Markets, or other appropriate state agency. Simplified procedures for PMA-RMA programs in states have encouraged many State Departments of Agriculture to begin work in developing much needed programs relating to marketing facilities, services, outlets, and information. A brief summary of the essential criteria or requirements in setting up an RMA basic data project may be of interest. These include:

- (1) An objective which promotes the welfare of agriculture within the purposes of the Act.
- (2) Cooperation of all agricultural agencies.
- (3) Formal cooperative agreements.
- (4) Appropriation of state matching funds.
- (5) Coordination of the project programs to avoid duplication of work at a district, state, regional, or national level.

As an example of an objective, consider the plight of filbert growers in Oregon and Washington. Because of large filbert stocks on hand, average prices received for filberts by growers of the two states dropped from \$551 per ton in 1945 to less than half that price in 1948. Producers appealed to Federal and State departments of Agriculture, and to their agricultural colleges for help in saving their industry. Interested agencies, including the Filbert Co-operative, met and outlined a first objective which was, briefly, to expand market information for filberts. The stumbling block to a reliable market information program proved to be the lack of important basic data of tree numbers by varieties and age groups. The most recent filbert variety survey was made by WPA in 1935 and 1936. No basic data exists that would indicate probable trend of production in the immediate years to come, or show to what extent tree removals have influenced bearing surface of filberts. As in most cases of a similar nature, basic data is the key that unlocks the door to a sound information program. Incidentally, a PMA-RMA sponsored project for filberts is now assured for both Oregon and Washington beginning in the next month or two. It will supply acreage, tree numbers by varieties and age groups, and production check data.

Cooperation of all agricultural agencies is essential in planning

any RMA project, whether it relates to market expansion, basic data, or technical assistance. Every Federal and state agency that is connected in any way with a proposed project program should be given an opportunity to cooperate fully by taking either an active or advisory part in the program.

Formal cooperative agreements are also an essential of each RMA project. There are the formal agreements between the Production and Marketing Administration and the state agencies concerned, and also the agreements and working arrangements among the interested agencies within the States. Fortunately a majority of the BAE field offices have long had joint Federal-State programs in operation under formal cooperative agreements, chiefly with State Departments of Agriculture, but in some cases with the State Agricultural College. Since RMA has made such a strong point of this type of cooperative work, there is inducement for other State Departments of Agriculture to sign formal cooperative agreements with BAE and other agencies carrying on RMA project programs. In those states in which formal BAE agreements have existed for several years there has been relatively little difficulty in securing sponsorship of much needed marketing research projects.

As previously indicated, one of the main reasons why RMA projects were slow in starting during 1947 and 1948 was that state agencies had made no provision for state funds for matching. Officials in charge of the administration of RMA look with considerable favor on marketing research or service projects for which state agencies are willing to bear half the expense. An appropriation by the state legislature is the best assurance to the Research and Marketing Administration that state agricultural agencies mean business. In some cases the State's contribution may be partly through technical assistance employed with state funds.

Perhaps the chief factor to be considered in developing an RMA project is that of coordination of agencies and integration of the program. Functions of the Departments of Agriculture, Experiment Stations and Extension Services should be clearly outlined to avoid duplication of work at county, district, state, regional, or national levels. The principal agricultural agencies in a State must work closely together if the marketing program of each is to be successful.

A few basic data projects are now in operation in the Pacific

Northwest Region, as well as state projects in Oregon and Washington, and several new proposals have been submitted. One of the earliest projects to be developed related to the soft wheat industry. For at least two decades, marketing of soft wheat produced in Oregon and Washington and northern Idaho has been a "problem child" of the entire wheat industry. Wheat producers there generally prefer to grow soft wheat to the hard varieties as the yield per acre is much higher. During the years when this country was at war, especially during World War II, production of soft wheat was considered as important as any other kind as it helped in the all-out drive to produce more food for domestic use and for our allies. At the close of the war, high production was still encouraged by government support prices, as it was necessary under the Marshall Plan to ship millions of bushels to starving people in foreign countries. About two years ago, however, it became obvious to leaders in the wheat industry and to many wheat growers that as soon as requirements under the Marshall Plan declined, the Pacific Northwest would be faced with a wheat marketing problem more difficult than ever before.

Credit should be given to E. J. Bell, Manager, and the Board of Directors of the Oregon Wheat Commission, for initiating a program directed toward solving the soft wheat marketing problem. Early in 1947 Mr. Bell and his organization began development of a Pacific Northwest wheat project. They realized the opportunities for assistance under the Research and Marketing Act and were desirous of matching funds to secure every possible help in solving wheat marketing problems for the Pacific Northwest states. It was apparent from the start that any project work performed in Oregon would be of no value unless similar work was carried on in Washington and northern Idaho, and there has never been any thought but that the project must embrace all three states.

At the earliest meetings with the Washington-Idaho Wheat League, large producer groups and the Washington, Oregon, and Idaho State Departments of Agriculture and colleges of agriculture, Mr. Bell's plans were generally approved. From the outset the co-operating agencies found a dearth of information needed for expansion of marketing services or developing new markets. Records were very incomplete regarding utilization and disposition of the Pacific Northwest wheat crop after it had left the grower's hands. In other words, basic data were required, historically for as many

years as could be recorded for coastwise boat shipments, rail shipments, and foreign exports—all these by destination; also, quantities of wheat used locally for milling into flour and feed, wheat utilized by feed mills, quantities of wheat sold or traded by farmers to farmers, and an accurate check of acreage and production of wheat by varieties. None of the basic data for these items were available at the time the project began. At the close of the fiscal year just past, results of work on the project indicate that the historical record on coastwise shipments and foreign exports of wheat has been almost completed. Records had been obtained from most of the larger wheat mills, and an enumerative survey of smaller feed mills was nearing completion. The project has been extended and broadened for the current fiscal year.

Wheat variety surveys are now under way. Plans are being made to check railroad waybills in Milwaukee, St. Paul, Omaha, and local points within the state to obtain historic data of rail shipments of wheat by destination.

From the original start made by Mr. Bell and his Associate Project Leaders, N. I. Nielsen, Agricultural Statistician of Oregon, and Professor Harrington of Washington State College, the program has expanded this year to cover work not only on basic data but also other marketing information and development of new market outlets. This was brought about by Sverre N. Omdahl, Director, Washington State Department of Agriculture, who made specific requests to the State Legislature and was provided with funds for matching purposes to aid in research and marketing problems of all Washington farm products, with special emphasis on wheat. After calling a meeting of leading wheat producers and interested agencies, Director Omdahl submitted project proposals to assist in carrying forward the original basic data project and also to provide a new project aimed at developing both domestic and foreign markets for wheat. The new project will be closely coordinated with all other programs relating to Pacific Northwest wheat.

Estimated total cost of the project for the first two years is \$35,000. To maintain the new basic data series currently will cost at least \$10,000 per year, and state agencies expect to carry on their full part of the program. The question uppermost in the minds of practical wheat men is whether this outlay of funds can be justified. Evidence is overwhelming that returns from the investment will be far above the cost. For example, basic data already indi-

cates lowered sales of wheat and flour in the southwestern states, and if soft wheat sales there can be stimulated to regain lost ground, sales of wheat and wheat products will gain about three million dollars. Paralleling the basic data survey of wheat is one on transportation and rail rates by other than government agencies. Should the request for a downward revision of freight rates result in only a general reduction of one cent per bushel for wheat, the savings to producers would equal one million dollars.

It would appear, therefore, that the Pacific Northwest basic data wheat project is both paying its way and paving the way to improvement and expansion of the marketing program.

A fruit project started a year ago in Washington under cooperative agreements of the State Department of Agriculture and BAE's Seattle office with PMA-RMA, has developed a series of apple prices by varieties and sizes for 1947 and 1948 crops using reported F. O. B. sales of nearly 30 million boxes of apples. Significance of this data is that it shows the varieties and sizes of apples that sell at premium prices, and those that fail to bring cost of production. Another phase of the project was a combination mail and enumerative survey of fruit trees and grapevines by varieties and age groups. Use of state horticultural inspectors to secure records from orchardists who failed to respond by mail, has not proved entirely feasible, but results for some counties have been excellent. A preliminary tabulation of growers' record cards indicates a large increase in acreage and tree numbers for many kinds of soft fruit, and indications of fruit tonnage increases in the next five years range up to 25 percent (for sweet cherries). Expansion of grape acreage provides the indication of potential production by 1954 of double the present production. Basic data on prices of apples and numbers of fruit trees and grapevines secured by this PMA-RMA project is an example of the type that brings immediate returns to farmers and fruit growers and their allied organizations. Similar projects are being successfully conducted in other States.

From a personal viewpoint, the extra administrative and technical work of carrying on RMA basic data projects in the state of Washington has been much heavier than first anticipated. This indicates the need for additional capable technicians in BAE field office staffs to carry on such work. Accordingly, my advice to agricultural statisticians about to embark on cooperative RMA basic data projects is to be certain of sufficient funds for another top

professional on the staff, in addition to the clerical workers usually supplied.

In conclusion, basic data and related agricultural statistics are now being developed through cooperative RMA projects that would not otherwise exist. Of all activities under the Research and Marketing Act which may be undertaken to further research or to improve the marketing of agricultural products, basic data projects will continue to develop the type of definite results that will be widely useful to all interests in guiding current and future production and marketing programs.

DISCUSSION

GEORGE A. SCOTT
California State Statistician

The Research and Marketing Act greatly broadens the opportunity for Federal and State agricultural agencies to assemble additional data about farm products, when these data are helpful to producers in working out more efficient marketing methods. With its country-wide network of field offices, the majority of which are jointly operated with state agencies, the Bureau of Agricultural Economics is in logical position to participate in this expansion of basic information, when the need for data dictates that such action is worth while and appropriate. Requests for new and detailed agricultural data pile up in the offices of the State Agricultural Statisticians testifying to the need for more and better information in this field. These requests originate mainly among state and federal agricultural workers, and in producer groups seeking solutions of their marketing problems.

My comments relate specifically to the topic as it applies to these state offices of Agricultural Estimates, Bureau of Agricultural Economics, where RMA project work may be carried on with cooperating state agencies. They are based largely on our two years' experience with RMA project work in the California office.

The California office began planning RMA projects in the winter of 1946-47, and proposed specific projects early in 1947. The State Legislature authorized and appropriated funds for RMA project work in the spring of 1947 for use during the 1947-48 fiscal year. About a year later we were allotted limited federal RMA funds and given the green light for RMA project work, under standard agreement with the Production and Marketing Administration. Thus, before July 1, 1948, only a small beginning was made on one project. State funds again were made available for the 1948-49 fiscal year, and by early July we had assurance of matching federal RMA funds. Two main projects were in operation throughout most of the last fiscal year. In addition, we completed a small special survey, and started another good-sized project. The total combined funds used by

Agricultural Estimates for RMA project work in the state during the last fiscal year amounted to \$88,000. On one of these projects the counties contributed additional direct assistance, amounting to approximately \$25,000.

One project supplemented and enlarged upon the annual fruit and nut acreage surveys carried on in the state, in which the acreage of these crops are recorded farm by farm, and are summarized by county, by age groups, by kinds, and by major varieties, and include records of pull-outs and new plantings. The second project was concerned with developing poultry statistics through sample interview surveys. The third was a survey of bush berries in the state. The fourth involves surveys of the progress of raisin harvest, and estimates of raisin production, for which most of the work will be done in August, September, and October of this year. All of these were begun with the intention of maintaining the series of data year by year, so far as they proved to be useful to producers in connection with their marketing programs.

These projects have produced useful statistical data. However, some of our experiences with them have not been altogether happy, resulting in some sobering reflections.

Most of our difficulties stemmed from the fact that the responsibility for practically all planning, administration, operations, tabulations, analysis and preparation of reports, fell upon regular staff members who already have overburdening demands upon their time. Thus, the RMA project work seriously interfered with the regular duties required of our staff. Moreover, under such conditions, full justice could not be done the new projects. You may well wonder why additional help was not employed. The answer is that it is not possible to find qualified people on short notice to step in and carry off these jobs; nor is it possible to attract or to employ capable men in positions that offer little assurance of tenure. We also grossly underestimated the amount of time required of professional staff members to carry out these RMA projects.

Many difficulties and delays were encountered in setting up details of operation for proposed expenditures, clearing schedules, hiring personnel under rigid state and federal Civil Service regulations, and related matters. In order to start an RMA project in our state, a proposed budget must be drawn up many months in advance, hoping that the State Legislature will approve, that the project will be approved in Washington, and that adequate matching funds will be made available. Thus, financial plans, and at least general work outlines, must frequently be developed a year or more ahead of actual operations. Detailed plans for the conduct of a project must be worked out well in advance, and must be frequently revised to conform with funds finally allocated for the work. Many of these irritating and time-consuming details could be taken in stride if the statisticians and their assistants had adequate time to devote to them.

We have also been requested to make special studies or surveys on short notice, after it is too late for such projects to be included in our scheduled program. Normally, little can be done about such requests because of expected time lapses in clearance and approval. However, we were fortunately able to respond to two of them, because general provision had been

made for such situations, and one of our projects could be expanded or contracted to meet such emergencies.

It seems proper to say here that many types of agricultural data have maximum value only when they appear in a continuing series. Thus, it seems that proposed development of basic statistics under RMA projects deserves careful advance planning, and reasonable assurance that useful series will be continued. The uncertainty of simultaneously obtaining both state and federal matching funds for such continuing work is a source of considerable worry.

I suggest that State Statisticians exercise due caution, before new RMA projects are undertaken, to plan the work carefully in all its stages well in advance, to see that provision of both state and federal funds will be fully adequate to do the job outlined, and to assure the employment and training of capable professional personnel to carry on the work. When state appropriations for such work are based upon forward budget requests, one can hardly expect to go through all the preparatory steps for a good-sized project in less than a year, and it may well take two years before everything is synchronized.

Perhaps BAE could make more effective contribution to the development of basic statistical data for use in RMA programs, if more direct allotments were made to BAE by RMA. Such an arrangement would make for greater flexibility in operations, and would result in increased efficiency and uniformity in performance and results, especially when several states are involved. Proposed RMA projects relating to the marketing problems peculiar to a single state or to only a few states may best be carried on with matching federal and state funds. But it is believed that the procedures for implementing these cooperative projects might be simplified without impairment of the controls that are necessary in accounting for the use of public funds.

THE MAILED INQUIRY AND METHODS OF INCREASING RETURNS

FLOYD K. REED
Colorado State Statistician

THE mailed inquiry has provided the major source of information on the nation's crops and livestock since Abraham Lincoln's Secretary of Agriculture first sent out inquiries during the Civil War days of 1863. Significantly, it was learned at that time that the country's food supply would be adequate to meet war needs. This method of obtaining up-to-date information regarding agricultural production, combined with inquisitive and observing field travel and contacts with individual farmers for certain types of information, has been the backbone of the country's crop and livestock forecasting and estimating program for more than three-fourths of a century. With this long record of achievement, it would seem that much can be said in its favor and little need be said in its defense. More recently through a succession of years in World War II and down to the present, as late as August 10, 1949, use of the mailed inquiry has proved its worth as a reliable source of information regarding production of the country's crops and livestock. The crop and livestock reports compiled from this type of information during World War II formed the basis for establishing a reliable food production and distribution program. As in 1863, but this time through six war years and subsequently, large crops were revealed by this source of information. Plans for effective use of our food supplies were and are predicated upon the reliability of data thus obtained. It seems now quite clear that when we were exporting large quantities of food to all parts of the world during these war years we could easily have exported ourselves into a condition of serious food shortage or even semi-starvation had these reports not been reliable.

Much is taken for granted when we use the mailed inquiry as a source of information. In the first place, the mailed inquiry makes use of the facilities of the Post Office Department, a far-flung and wholly reliable government agency, in lieu of setting up an expensive field organization for making the necessary contacts. It assumes a high degree of intelligence, education, and ability on the part of recipients. It is one of the best illustrations of the operation of our democratic process wherein producers of crops and livestock

cooperate with a government agency in their own and the public interest.

Other advantages of the mailed inquiry are its comparatively small cost, and the speed with which the information can be cleared, even in a country as large as the United States, through use of its extensive and swift transportation system. The mailed inquiry makes farmers or ranchers feel that they have a personal part in making the report for their own industries. One who cooperates in filling out a mailed inquiry and thoughtfully makes a record of his judgment and knowledge probably comes very near giving his real views regarding the condition of crops or agricultural developments in his locality. One who votes his convictions in the privacy of the voting booth might vote differently if someone were looking over his shoulder. A substitute for this type of mass judgment or "safety in numbers" factor in appraising the condition of crops or livestock would be extremely difficult if not impossible to devise. The use of this mass judgment factor has proved its worth many times. It is the foundation of the crop-forecasting system. The good judgment of many minds tends to give stability to the appraisal. Most judgment information has related to the condition of crops and livestock, but it has also been used to a limited extent in measuring the changes in crop acreage and in livestock numbers. In addition to judgment information, "sample" data concerning individual farm operations, such as crop acreages and livestock numbers, are obtained through use of the mailed inquiry. These form an essential part of the fact-finding program.

If we were to sum up the advantages of using the mailed inquiry, we might list *speed*, *economy*, and *reliability* as the three great virtues of this method of obtaining information regarding the country's great and diversified agricultural plant.

Problems and Difficulties in Securing Response

Even with the three great virtues of the mailed inquiry, the very title of this paper implies that difficulties are being experienced in obtaining adequate replies. This title might even imply that use of the mailed inquiry was on trial or was facing competition. Both inferences are at least partially correct.

A comparatively recent inquiry to BAE field offices brought many remarks about the difficulty of obtaining replies to mailed inquiries, but there was little comment about the cause of poor response. If we are to understand why we have problems of obtain-

ing a sufficient number of returns or a sufficient percentage of returns we must first understand why we are experiencing these difficulties. Let's think about these for a moment.

Subsequent to passage of the Homestead Act of 1862, particularly in the West, the United States Government was viewed by many as big-hearted, a government which gave every man 160 acres of land for the mere act of residing upon it and "proving up." The Government itself was a rather abstract or incidental sort of thing in the minds of many people. Many people weren't conscious of the Government touching their daily lives to any considerable extent other than through the Land Office. There may have been a strong feeling in those days that only good came from government, partisan political feelings may have been less intense, and views on social philosophy were perhaps less controversial. Income taxes were for the most part nonexistent. In those earlier years and well into the present century, when farmers and ranchers received crop or livestock inquiries from a government agency, they viewed it pretty much as an honor or a privilege to furnish information to a generous government. Because the economy of the country was less involved than it now is, these inquiries were shorter and came less frequently. With economic problems becoming more involved and the agricultural industry more highly developed, these inquiries have grown longer and the farmer receives them more frequently. Recently, in many cases, instead of feeling that he has been singled out as a person worthy to do his government a small service, he is inclined to look upon these inquiries as "just another of those things."

Only 15 years ago crop and livestock inquiries comprised the principal kind of franked or government mail received by most farmers and ranchers. In recent years they receive government mail from many sources and many of them give hours of their time to serving on government agency committees of various sorts. (Many also serve on county and state boards and committees not directly related to Federal government activity.) This leaves less time for filling out crop and livestock inquiries and many feel that in doing this type of committee work they are doing all the "useful citizen" work for which they have time. All these developments have increased the difficulties of obtaining adequate response to mailed inquiries, but their growth was *gradual* the first half of that 15-year period.

During World War II these aversions *increased rapidly*. Among

the causes were irritations resulting from price regulations and shortage of labor and material. During that comparatively short period income taxes came as a new experience to most farm and ranch people. Changes in farm ownership resulted in many old-timers who had been crop reporters for many years leaving the farm. In a goodly portion of cases they did not pass the crop-reporting responsibility to younger hands. Occasionally one meets an old-timer at agricultural meetings who points out that before retirement from the farm he was a crop reporter. One meets others who say, "I used to be a crop reporter but quit because of the pressure of other activities." Still others adhere to the old bugaboo, "I used to be a crop reporter but gave it up because I felt that it was only for use of speculators."

These general considerations, together with the *negative influence of much adverse criticism leveled at government* in recent years, have greatly reduced returns. This, together with the very presence and demanding activities of many public agencies, has done much to dry up the source of information so fruitfully available through use of the mailed inquiry. The agricultural statistics agency needs the help of all these agencies in informing farmers and ranchers of the need for these basic facts and in overcoming the negative attitude toward furnishing them.

If we are to increase both the actual number of returns to mailed inquiries as well as the percentage response, we must take steps to overcome these inherent difficulties.

In light of the above obstacles, it appears that the kind and form of the questionnaire may be secondary to the inherent willingness of the farmer or rancher to respond. The questionnaire itself involves the mechanics of the problem, but the willingness to respond can only be increased by a broad-scale and continuous educational process. It is in this field that other agencies working with agricultural groups can be most helpful.

Methods of Increasing Returns

Methods of increasing returns may be divided into three categories: (1) Appeal letters or letters of explanation; (2) the questionnaire itself together with the mechanics of distribution; and (3) education as to the need for making the report. The educational aspects need immediate as well as long-term and persistent atten-

tion. This paper does not deal with the mechanics of selecting the correspondents or the methods of insuring proper distribution of returns.

Appeal letters should be impersonal in an individual sense and free from reference to controversial subjects. Many people are public spirited, and an appeal to this aspect of citizenship or that the information is being obtained in the interests of the industry generally or the particular commodities which the individual produces may be effective. Emphasis on the fact that response is voluntary and that individual reports will be held in confidence has strong appeal. (The feeling on the part of many, however, that there is a relationship between reports and income-tax collections is difficult to overcome.) Pointing out that serving as a crop or livestock correspondent will increase the individual's power of observation and retention of information seems also to be effective. A little encouragement in the way of suggesting that the correspondent should not make too hard work of filling out the report is helpful, and statements like "report for your own farm and in addition just put down what you know about conditions from your day-to-day observation in your locality" are also helpful. If the recipient can be made to feel that it is in his interest to fill out the questionnaire, he will be more likely to respond. As one of our reporters put it, "A man ought to fill out those questionnaires for his own selfish interest if for no other reason." The old statement that "a man's judgment is no better than his information," followed by a reference to the effect that "working without agricultural facts is like working in the dark," appeals to the practical minds of rural people. It is almost a duty to point out that having accurate facts regarding agricultural supplies is as important in making a profit in agriculture in these times as is use of new varieties, adequate fertilizer, and control of insects and diseases. Pointing out this important fact is an essential part of the immediate, as well as the long-term, educational program. Mr. Creer of our Montana office has developed a short appeal letter which starts out, "Has someone been kidding you?" He then goes on briefly to shoot down the clay pigeons regarding the impression that facts concerning agricultural production are for the benefit of the speculator only. Some years ago the Colorado office developed an appeal letter which started out, "There's no use kidding," and then took the farmers and

ranchers into our confidence regarding the fact that returns were becoming inadequate for proper service to the industry. This met with fine response and did much to increase returns.

It isn't practicable in a paper of this sort to deal with all the ways of appealing to rural people for cooperating in returning mailed inquiries. Yet a few additional points should probably be mentioned. No effort should ever be made to make replies compulsory. My experience in studying the Japanese crop-reporting system revealed that, even in a country like Japan where requests were mostly orders, the agricultural statistics data had a pronounced downward bias resulting partly from this compulsion factor. The situation there, as in some of the war-torn European countries, was no doubt aggravated by the exacting food-collection system, but the principle of what happens under compulsion is well illustrated. Because of the rather serious nature of the business, anything of the "atta boy" or "let's die for dear old whozis" nature would probably have little appeal. It would be more likely to bring criticism. Likewise, an appeal of the sort that implies "this will be good for the crick in your back" will not bring results. The appeal must be sincere, informative, realistic, and to the point.

Coming now to item number two, the schedule itself should not be unduly long and it should have definitive application both locally and to the problem at hand. The question should be clear and the mailing data timely. No questionnaire should prompt a reaction like the cartoon which appeared during the mid-war years. The scene pictured a farmer and his wife sitting around the livingroom table in the evening. The wife had just opened a letter and was saying to her husband, "It's from the government, Pa. It's about that plow you ordered. They want to know what you're going to use it for."

The mechanics of obtaining responses are pretty much a separate consideration. One thing seems important—it should be readily possible for one who is willing to serve as correspondent easily to identify mail originating from the crop-reporting office. Use of window envelopes with the individual's name on the schedule has proved a stimulant in some cases. One of our offices sends out a simple "pre-survey" card reminding the folks that in about a week they will receive an important inquiry form and that it will be appreciated if they will fill out the inquiry and return it promptly. Placing of special words on the envelope or on the schedule, such

as "Urgent," "Answer Requested," "Please," "Special Crop Inquiry," etc., make their own special appeals. During the war the Colorado office stamped the outside of the envelope with "War Emergency Makes It Important That You Return This Inquiry Regarding Food." The immediate response to this appeal was tremendous. (Even using this stamp on inquiries going to broomcorn growers didn't seem to minimize its usefulness.) The significance of this particular phrase was that it had strong appeal because it was tied to an important cause. Others can be devised to meet current conditions, and although they may not have the strength of appeal the war had, at least they will make individuals feel a personal responsibility in giving a complete reply. Appeal to what is sometimes called "sweet economic reasonableness" is unlikely to be effective in dealing with rural folks.

We come now to item three which to me is the most important phase of this work and one that needs the most attention by the most people—the educational phase. The discussion so far should have made clear that a small organization like the present crop and livestock estimating organization cannot cope with the broad-scale need for education in this field. It is a job for many. Farmers and ranchers themselves are the main source of accurate information regarding crop and livestock production in its various phases. It would seem therefore that the matter of cooperating in a phase of work which has such an important bearing on agricultural problems should be emphasized in the educational system, including the rural schools. There should be a place for emphasizing the need for farmer assistance in this work in the vocational agricultural program, the college economics courses, and in the program of the Extension Service. It would seem to be as important that a farmer or rancher learn through his educational process about the part he can play in developing facts about his industry as it is that he know how to farm well or how to manage livestock intelligently. Personnel of government action agencies, who frequently hold meetings with groups of rural people, should emphasize this point. This might well be an important phase of the educational program of the Extension Service.

Officials and directors of commodity group organizations, such as potato, sugar beet, wool growers associations, should be requested to call the attention of their membership to the importance of returning the inquiries they receive, from which important economic

facts bearing on their commodity are developed. The importance of this action should be brought to the attention of leaders of the large farm organizations. We have worked with all these groups in Colorado with considerable success, but this matter needs to be frequently emphasized. The importance of returning these inquiries which are the fact-gatherers for the agricultural industry won't go across in one easy lesson. It must be emphasized by repetition, much like the Negro preacher who, when asked why he was so successful in getting many conversions, replied, "First I tells 'em what I'se gwine to tell 'em. Then I tells 'em. Then I tells 'em what I told 'em." So it is with the educational process of increasing mailed inquiry returns. It must be emphasized in spring, summer, fall, and winter. A principle of salesmanship is that you can sell a commodity if you can make the customer want it. Mailed inquiry returns can be increased by making the respondent *want* to fill out the inquiry or through making the reminder so pleasantly irritating as to insure a return for the sake of gaining a clear conscience.

Persons of all government agencies which contact farmers should say a good word for the mailed inquiry. Since all need the facts which these inquiries develop, all will benefit from the results. Good percentage response, in addition to making the data more authentic, will cut costs and cut wear and tear on brake linings of rural mail-carrier automobiles. There should be a joining of hands on the part of all groups that have an interest in and a need for these basic facts.

Careful thought should be given to current and future needs for factual information. Many times in the past there has been demand for historical data which, because they were not currently compiled, were gone forever. With this lapse of time any facts developed subsequently would of necessity have to be of the "crystal ball" nature.

In many respects a nickel's worth of statistical-gathering machinery is available to cope with a dollar's worth of problems which need reliable statistical and economic facts for intelligent solution. It would seem, therefore, that for the present at least the best alternative is to continue to make the mailed inquiry effective and to improve its results as much as possible. (Here again let me point out that some of the usefulness and advantages of the mailed inquiry could not be exceeded even with expenditures of large sums of money.) Recognizing the democratic principle embodied in use of the mailed inquiry to the voluntary reporter, and the assurance

of continued large rewards, the helping hand of all agencies should be extended in its support and improvement.

DISCUSSION

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Bureau of Agricultural Economics

More and more, efforts have been made to improve on the many phases of mailed sampling techniques. This has led to research in sampling by mailed inquiry along the following lines:

- (1) Design of questionnaires
- (2) Characteristics of respondents and factors affecting response
- (3) The use of controlled and semi-controlled mail sampling
- (4) Techniques involving repeated mailings and follow-ups

(1) *Design of questionnaires.* One of the principal faults of many questionnaires is that there is so much to ask and explain that the printing has to be extremely small to get it all on the schedule.

When the proposal to shift the Prices Received schedule to larger type was made, a method for testing response was set up in four mid-western states. One group received the old type schedule and the second the new which is set with larger sized type and in which much of the explanation appearing on the old type schedule has been eliminated. New respondents were also separated into two groups and sent the two types of schedules. So far the record of returns from the two questionnaires indicates no significant differences as to the rate of returns between the new and the old for either the regular reporters or for the tryouts.

Another experiment has been tried in Tennessee and Kansas involving the Prices Received questionnaire. This questionnaire is rather long; it contains about 50 questions on prices and goes each month to buyers of all kinds of farm products. Often a particular reporter handles only a few of the items covered. Four short separate questionnaires were designed, with the commodities grouped so that the respondent on a particular list would be handling most of the commodities on which prices were asked. The results have been carefully analyzed and in neither state does the "T test" indicate a significant difference between the prices reported on the regular schedule and those reported on the split schedule. The percentage of return from the split questionnaire was higher but in terms of total number of price quotations per questionnaire mailed the regular inquiry was more efficient. Generally, it resulted in a larger number of price quotations for a particular item than did the short schedule.

It has been found that often leading questions relating to some general item or items will have pulling power and will encourage returns from reporters who have few or none of the items being sampled. For a long time many of the special surveys used by Agricultural Estimates have carried questions of a general nature, primarily for their pulling power. Obtaining reports from the so-called "zero" reporter is of utmost importance in mailed sampling.

"Fatigue" in reporting has been generally accepted as a major influence in response, both on mailed and interview surveys. Some recent explorations into this field reveal that response is not always closely correlated with length of questionnaire. It is evident that the "interest" factor is a major influence in offsetting fatigue.

Tests on the effect of using airmail for sending and returning schedules showed a significant difference in the rate of response when airmail was used. The gain in one instance when airmail was used both out and back was as much as 30 percent.

Back in 1940 Illinois tabulated 26 percent of the number of questionnaires mailed for an August cattle on feed survey. That inquiry contained only five questions; it was mailed to a developed list of reporters. Contrast this with the returns of 72 percent from the July 1, 1949 cattle on feed questionnaire in Illinois which contained 32 items. We need more research into response on questionnaires that yield a high return.

(2) *Characteristics of respondents and factors affecting response.* A number of studies have been made on differential response to mailed inquiries, especially in connection with controlled and semi-controlled mailed sampling. Analysis made of the returns from a controlled mail survey on livestock showed significant differences in response, with farms having large numbers of cattle more likely to reply than those having small numbers. For hogs, however, farm operators with large numbers were less likely to respond. On this same survey it was found that response varied according to age of the operator, with the middle age groups showing the highest rate of response. A mailed survey in January 1948, on livestock, grain stocks, and tractors revealed a tendency for "farms with no tractors" to respond. In delving more deeply into the problem of response, more work needs to be done on studies where social and economic status of the reporter is associated with response.

(3) *The use of controlled and semi-controlled mail sampling.* Various interview surveys made in January 1947 and in April and September 1948, provided the basis for controlled mailed sampling for five surveys dealing with electricity, livestock, grain stocks, tractors and meat curing. In some of these surveys returns from mail inquiries so closely represented the parent sample on certain check or control items that no special adjustments for differential response were needed. For other items the response was selective and adjustments were needed.

In semi-controlled mailed sampling, certain data, which have a high correlation with the item or items to be estimated, are abstracted from the State Farm Census or other major surveys, for each prospective respondent who is to receive a mailed inquiry. It is possible, therefore, to determine beforehand how well the sample reflects the universe by comparing averages of the control items for the sample, with averages for the same items from the State Farm Census or other major survey from which the sample was drawn.

Our experience in using this method has been exceptionally good. Analysis of the control data for the mailed returns supports the general belief that crop reporters are a selective group.

(4) *Techniques involving repeated mailings and follow-ups.* Studies have been conducted to determine the effects of repeated mailing and follow-up techniques on sample averages. The Wyoming Livestock Loss Survey discussed by Mr. Knutson showed that the sample of nonrespondents had smaller losses on the average than those who replied. In general, the first wave of returns from a survey on a specific item tends to include reports from individuals who have something to report and who are most interested in the subject. Those with small numbers, or those having none, are inclined not to send back the questionnaire. Repeated mailings or follow-ups encourage a response from those who failed to return the first questionnaire received. In some cases each follow-up return progressively yields a smaller average, thus tending to lower the average for the entire survey.

Data from repeated mailings tabulated separately for the purpose of studying response show that in many cases the percentage response to a second request is as large or larger than from the first mailing.

There is a study on use of special envelopes that is just starting which will be of interest to this group. Mr. McCandliss of our Mississippi office has designed a special, distinctively marked outgoing and return envelope to be used for our General crop surveys. With the permission of the Post Office Department the effect of these envelopes will be tested in five states during the next few months. It is hoped that the envelopes will (1) increase the total response and (2) cause replies to be returned more promptly. Both of these hypotheses are to be tested.

Conclusions

There are other illustrations of new developments in mailed sampling which have not been mentioned. Some studies and sampling schemes have been covered only briefly and others omitted because they closely resembled those presented.

In reviewing the progress one might conclude that great strides have been made in the field of mail sampling. But the surface has been barely scratched. It is folly to conclude that the results of a set of experiments derived from one survey or on one subject apply equally well to other surveys or other subjects. Each of the surveys, each of the subjects, each of the commodities have their individual problems in response, in sampling methods, and in treatment of data. These problems need to be solved by a process of continuous investigation along all lines.

These new approaches in mail sampling, however, point up the importance of "follow-up" practices. They show advantages to be gained by systematic repeat mailings and separate tabulations. Not much has been done on follow-up interviews of nonrespondents to mailed inquiries such as was done in the Wyoming Livestock Loss Survey.

Experiments show that there are ways to improve response to the mailed inquiry. Dwindling returns should be not the inevitable consequences of mail sampling. New schemes need to be tried and newer ideas developed. More than that, tests must be continued to find the factors associated with response and the best design for mail questionnaires.

WINTER STORM LIVESTOCK LOSS SURVEYS IN WYOMING

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THE Western States were besieged by storms and subnormal weather during the months of December 1948, January and February and until mid-March of 1949. Wyoming experienced its worst storm on record during the period of January 2, 3 and 4. During this storm, wind velocities reached 68 miles per hour, temperatures dropped to eight below zero, coupled with snow. Highways, byways, and railroads became blocked with snow drifts varying in depth from a couple of feet to as much as 15 feet.

Another storm, of somewhat lessened intensity, occurred in February in the Red Desert Area, embracing Carbon, Sweetwater, and Natrona Counties. During this storm wind velocities attained a maximum speed of 75 miles per hour. Temperatures were below zero and snow fell during the storm. The highways and railroads were blocked for an 11-day period because of ground blizzards.

The first blizzard encompassed a very wide area in the eastern part of this state. Eleven of the 23 counties of the state became snow-bound. There appeared to be two vortices in this storm. One centered around Cheyenne, and the other at Van Tassel, which is close to the northwest corner of Nebraska.

Shortly after the storm broke it became manifest that there would be a severe loss to livestock and wild game on the plains. Some animals froze to death, others were smothered by ice closing the nostrils, appendages were frozen, which in some cases made it necessary to destroy the animals. The economic loss to breeding animals was believed to be great and mounting daily. Unofficial estimates of losses took on huge proportions. Some unofficial estimates of the number which perished in the blizzard were as high as 50 percent of the cattle and 75 percent of the sheep. Our office was besieged by the press, stockmen, lending agencies, and others who wanted information on death losses. The wild rumors of losses suffered was giving the state considerable adverse publicity. As time went on the pressure for exact information as to the death losses became increasingly great.

The Bureau of Agricultural Economics is charged with the responsibility of collecting and publishing significant statistics of the

livestock industry. These statistics not only include estimates of the number of livestock on farms and ranches at any given time but also many other factors that influence the livestock population. Estimates of death losses to livestock and other storm damage affecting livestock fall into this category.

Frequently the residual effects as shown by subsequent poor condition of breeding animals, forced marketing due to injuries, and reductions in the calf and lamb crops are of far greater importance than the immediate death losses due to the weather phenomena. However, the great variation in the publicity as it affected the livestock industry required that an early survey of losses be undertaken.

During December the comprehensive annual Rural Carrier Survey of livestock on farms is completed. This survey is the basis for the official Department estimates of the livestock population as of January 1. Completed questionnaires are received from many hundreds of farmers and ranchers—reporting their own livestock numbers. It was decided that a short concise storm loss questionnaire would be mailed directly to each of those operators located in the storm area who responded in the Rural Carrier Livestock Survey. The primary purpose of the survey was to obtain a rough estimate of the level of losses in order that any contemplated action programs could be planned with a reasonable degree of accuracy. As only about three weeks had elapsed between the January 1, livestock population estimates and the date of the storm loss questionnaire, it was felt that memory bias would not be a significant factor.

The storm loss questionnaire was extremely simple in that the respondent was asked to report: (a) the number of all sheep and lambs he had as of January 1, (b) the number that had died due to the storms during the month and (c) the number of additional losses he expected to have because of the storm. In the case of cattle the same three questions were asked but, in addition, the respondent was asked three additional questions about his 1948 calves. This latter separation was made because of persistent reports that yearlings and other young cattle had suffered more extensively than older stock.

The questionnaire was mailed during the period January 24-28 and the survey closed on February 7. The computed percentage death loss was then applied to the January 1 population of cattle

and sheep to produce an estimate of the actual loss in terms of number of head. The loss survey results were published in an official release by the Department of Agriculture on February 10, 1949. The significant data by states are as follows:

TABLE 1. LIVESTOCK STORM LOSSES UP TO FEBRUARY 1

State	Cattle		Stock Sheep ¹	
	Percent Lost	Head Lost	Percent Lost	Head Lost
South Dakota	1.6	16,000	2.5	13,000
Nebraska	2.6	46,000	7.0	23,000
Wyoming	3.0	16,000	4.8	49,000
Colorado	.8	3,000	.5	2,000
Total Storm Area	2.0	81,000	5.3	87,000 ²

¹ Excludes sheep and lambs on feed.

² An additional 10,000 head was estimated to have been lost in the fringe storm areas and in feed lots.

The foregoing summary of storm damage did not mark the end of the winter livestock losses in these western states. During the month of February additional storms harassed the area and were particularly severe in the south central and southwestern counties of Wyoming. This area comprises in part the very important winter sheep range known as the "Red Desert."

In the early part of April funds were made available for a comprehensive livestock loss survey in Wyoming. This state was selected because of its nearness to the center of the storm area and because of a demand from Wyoming farmers, ranchers, and state officials for a final comprehensive appraisal of the winter storm damage to the livestock industry. Reports were again persistent that sheep losses during February had been very severe and that the calf and lamb crops would be greatly reduced.

My office is fortunate in that it has available a nearly complete list of names and addresses of farmers and ranchers in the state. The second livestock loss survey sample was designed as a combination mail and non-response interview procedure. The mailing procedure required that one mailed follow-up be sent to each farm or ranch operator who failed to respond to the original questionnaire. The follow-up questionnaire was accompanied by a letter soliciting a response. After the returns from the follow-up questionnaire were collected a sample of non-respondents were selected for personal interview. The original mail sample was drawn at random and stratified by counties proportional to the number of livestock farms

in the county. The area to be surveyed under this procedure included 14 eastern and central counties of the state. In addition a somewhat smaller mailed sample was allocated to the remaining non-storm counties. This latter procedure was included to permit comparisons of losses in storm versus non-storm counties and to permit inclusion of statements concerning the entire state in the report of winter livestock losses.

Past experience tells us that the winter and spring livestock loss in Wyoming seldom exceeded about two percent of the cattle and six percent of the sheep on farms and ranches January 1. Thus with such relatively small figures, it was desired to design a sample to yield a percentage loss estimate with a standard error of 0.5 percent. The standard error from a random sample of n farms is given by

$$(a) \quad S\bar{x}^2 (= s)^2 \left(\frac{1}{n} - \frac{1}{N} \right)$$

in which s = an estimate of the standard deviation of the individual farm death loss percentages and N = the number of farms in the universe. It was estimated the standard deviation would be 15 percent. Thus

$$(b) \quad (15)^2 \frac{1}{n} - \frac{1}{7,300} = .25$$

The desired sample size was computed to be approximately 900 farms or ranches.

In order to assure that the mailed response would reach the desired 900 farms and ranches a stratified random list of approximately 4,000 names was drawn in the 14 counties. In addition a stratified random list of approximately 2,000 names was drawn in the non-storm counties.

In the planning stages it was decided that the non-response interviews should be taken at the rate of about 10 per county allocated finally on the basis of the percent non-response and total number of farms by counties. As the survey developed, the amount of available funds and shortage of operational time would not permit the interview of the desired 140 non-respondents. The great distances between ranches required that the number of non-response interviews be limited to a maximum of 125.

The non-response interviews were allocated by making the number of such interviews proportional to the product Px , where P

is equal to the percentage of Census farms in the County, and x is equal to the percentage non-response. On this basis the minimum number of non-response interviews allocated to any county was five and the maximum 20.

Because of time limitations the program of field operations was very rigid. The loss questionnaire was first mailed out on May 9-10, with the follow-up circularized on May 18-19. The non-response interviewing started May 31 and ended June 4. This very short period did not allow full benefit from the follow-up mailing. However, the return from the mailed questionnaire was believed to be fully satisfactory although it did not quite reach the optimum number of 900 reports. On June 4 slightly less than 800 returns had been received. Late questionnaires received after the closing date for the survey have increased the return very close to the computed sample size. The non-response interview sample had about the same degree of incompleteness as the mailed sample. A total of 89 interviews were secured in five days—a period in which field work was seriously hindered by constant rainy weather. In a number of instances non-respondent farms could not be reached because of washed out roads. Without a definite procedure for repeated visits to locate absent respondents, it is doubtful that the non-response interviews would have exceeded 100 even with most favorable interviewing conditions.

Of necessity, the questionnaire used was rather complex and lengthy, considering the fact that we were interested only in livestock death losses. In order to hold to a minimum the memory bias usually experienced in obtaining information on livestock at some past date, such as January 1, it was necessary to frame the questions so that a January 1 inventory number could be derived from each report based on questions relating to births, marketings and deaths taking place since January 1 and on inventories at the time the loss questionnaire was filled out. Because losses from other causes, particularly to the new calf and lamb crops, are usually high, steps were taken to sort out losses to 1949 births. Provision was also made to give the respondent an opportunity to report losses due directly or indirectly to the winter blizzards, and to report on the number of cattle and sheep marketed because of injuries suffered during the storm.

In the expansion procedure the averages from the mailed survey were allowed to represent respondents while the non-response interview averages represented non-respondents in the universe. These averages were weighted to arrive at a single statistic for ex-

pansion purposes. In all cases the non-response interview sample provided a downward adjustment in the averages. It was found that non-respondents generally had no losses or lighter losses from the storms than did those operators who had responded by mail. In the analysis the first procedure was to expand the livestock population data to an independent estimate of all livestock on farms as of January 1. This would permit a comparison of the loss survey results with the official State estimate as established by the comprehensive Rural Carrier Survey, which series in turn is based on U.S. Census data. The expansion of the survey data for cattle inventories as of January 1 departed from the official estimate by 6,000 head—about one-half of one percent. In the case of sheep the sample was not quite as accurate with the survey result exceeding the official estimate by about three percent. This departure between cattle and sheep was not unexpected since the sample design was based primarily on the distribution of cattle farms.

Using the cattle data the actual expansion to the January 1 estimate of all cattle on farms follows:

$$(c) \quad \bar{x} = \frac{(\bar{x}_i)(w_i) + (\bar{x}_j)(w_j)}{w_i + w_j}$$

where \bar{x} = Respondents average

\bar{x}_j = Non-respondents average

w_i = Estimated percentage cattle farms represented by respondents

w_j = Estimated percentage cattle farms represented by non-respondents.

TABLE 2

Strata	Ave. all Cattle Per Farm	Number Farms	Indicated Number Cattle
Storm Counties			
Mailed Sample Interviews	116		
Combined	108	7,000	721,000
Non-Storm Counties			
Mailed Sample	80		
Adjusted by Interview Ratio	70	4,000	284,000
Total Number Official Estimate			1,005,000 head 1,001,000 head

The estimate of death losses was then derived through two independent approaches, (a) a direct expansion of the actual losses,

and (b) an estimate of the percentage loss of the January 1 inventory numbers. Again using the survey data for cattle the estimated losses were computed as follows:

TABLE 3. DIRECT EXPANSION

Strata	Ave. Loss Per Farm	Number Cattle Farms	Indicated Number Lost
Storm Counties			
Mailed Sample	6.6		
Interviews	4.4		
Combined	4.9	7,000	34,300
Non-Storm Counties			
Mailed Sample	2.7		
Adjusted by Interview Ratio	2.0	4,000	8,000
Total State			42,300

TABLE 4. PERCENT LOSS EXPANSION

Strata	Percent Loss	Cattle on Farms January 1, 1949	Indicated Number Lost
Storm Counties			
Mailed Sample	5.7		
Interviews	4.4		
Combined	4.7	686,000	32,300
Non-Storm Counties			
Mailed Sample	3.3		
Adjusted by Interview Ratio	2.7	325,000	8,800
Total State			41,000

To summarize then:

TABLE 5. TOTAL CATTLE LOSSES

Method	Storm Counties	Non-storm Counties	Total State
Direct Expansion	34,300	8,000	42,300
Percent Loss	32,200	8,800	41,000
Adopted Estimate	32,000	9,000	41,000

It can be noted that the Livestock Reporting Board adopted an estimate close to the result shown by the Percent Loss approach rather than the Direct Expansion or an average of both. A final estimate in even thousands was desired.

With respect to sheep losses, the same procedures were used and the following results obtained, although the data are considered to be less precise.

TABLE 6. TOTAL SHEEP LOSS

Method	Storm Counties	Non-storm Counties	Total State
Direct Expansion	121,000	37,000	158,000
Percent Loss	128,000	21,000	149,000
Adopted Estimate	125,000	29,000	154,000

Once the total losses were established several other interesting statistics became available. In the 14-storm counties the total loss of cattle was estimated to be 32,000 head (Table 5) of which respondents attributed 20,000 head directly to the storms. Of this 20,000 head, 4,000 head were reported to be 1949 calves. Thus the 16,000 head lost out of the January 1 population, as shown by the survey, finally turned out to be the same as the number estimated in the February (Table 1). The remaining 12,000 of the total 32,000 head lost in the 14-storm counties was attributed to natural causes. In the case of sheep (ewes) in the 14-storm counties, the total loss was estimated to be 121,000 head (Table 6) of which 97,500 head were lost because of direct storm causes. The data reveal that somewhat more sheep were lost in storms occurring after February 1 than were lost in the very severe January weather.

On a percentage basis these livestock losses for the state of Wyoming proved to be heavy but did not approach the unofficial estimates and speculations derived and published during and after the storm period. For cattle the average winter and spring death loss is somewhat less than two percent while the survey shows a loss of 4.1 percent for the 1949 January-June period. In case of sheep the 10-year average winter and spring loss for the state is 5.9 percent compared with the survey estimate of 7.4 percent lost during the January-June period of 1949.

The procedure utilized several of the best features of both mail and interview sampling. The cost was relatively low yet the results were timely and the data possessed many of the fundamental statistical characteristics widely claimed for interviewed samples. In livestock sampling the element of time is of utmost importance with a rapidly changing phenomena. In the case of the non-response interviewing rapport was established almost immediately upon contact since the respondent was already familiar with the survey and its purpose. This fact alone resulted in a very important reduction in interview time and reduced refusals to the point of practical insignificance.

PLANS FOR THE 1950 CENSUS OF AGRICULTURE

RAY HURLEY
Bureau of the Census

FOR many years, the periodic census was the chief official source of data concerning our farms and farm people. While other sources of agricultural data have increased greatly in importance, the Census of Agriculture is still the leading source of statistics on agriculture.

Planning for the 1950 Census of Agriculture began more than two years ago. These plans have been developed by inviting criticism, suggestions, and recommendations from a large number of persons, and by a series of pretests. The first pretest, in April 1948, included a complete census of two Missouri counties and a small-scale census in part of a township in each of 33 other areas scattered throughout the United States. The second pretest, in October 1948, comprised a complete census of four midwestern counties. The third pretest, made last May, included a complete census of two Southern counties, and a census of 64 segments having about 50 farms each and scattered among 43 states. The two most recent pretests have included a recheck by professional personnel for a sample of the farms included in the census. In all the pretests, census enumerators have been accompanied by technically trained persons who, as observers, noted the mistakes made and difficulties encountered in taking the census.

Plans for the 1950 Census of Agriculture may be conveniently outlined in three parts, namely, questionnaires, enumeration procedures, and tabulation and publication of results.

The development of the 1950 Agriculture Census Questionnaire began in 1947. At that time, the principal users of Census of Agriculture data, such as State Agricultural Colleges, State Departments of Agriculture, and farm papers were invited to submit suggestions and recommendations for the next census. From these and other users, several thousand letters containing suggestions and requests for the inclusion of inquiries in the census were received.

In determining the inquiries to be included in the coming census, dependence has been placed largely upon the recommendations of representatives of the principal users of the data. To obtain balance between various interests and to secure assistance in holding the number of questions within feasible bounds, the Director of the Bureau of the Census appointed in 1948 a Special Advisory Com-

mittee for the 1950 Census of Agriculture. This Committee was composed of representatives of agricultural publishers, State Commissioners of Agriculture, the U.S. Department of Agriculture, the American Farm Economic Association, the Grange, the American Farm Bureau Federation, the Farmers Union, and the National Council of Farmer Cooperatives. This Committee has considered and prepared recommendations concerning the numerous inquiries proposed for the 1950 Census.

The questionnaire is of the interview type. In this respect it differs from the previous record-type questionnaires. In the questionnaire most questions are stated completely and exactly as the enumerator would ask them. Experience has demonstrated that it is extremely difficult to get enumerators to understand the exact information desired and to ask the questions in such a way that they get precise information unless the questions are carefully worded and the enumerator uses the wording verbatim. Another important characteristic is the printing of the most important instructions on the questionnaire itself.

Regional or sectional questionnaires were first used in the 1940 census. In 1940 seven and in 1945 nine different regional questionnaires were used. In order to simplify the questionnaire and to obtain information on crops and other items that are important only in a single or a few states, it is planned to use 41 different regional questionnaires in 1950, each for a state or a group of two to four states.

The second part of the plans for 1950 deals with enumeration procedures. These include self-enumeration, training of enumerators, use of crew leaders, and procedures designed to improve the completeness of the coverage of the farm census.

The plan to use self-enumeration for the farm census constitutes the most important departure from field procedures used in past agricultural censuses. Through the use of post office facilities it is planned to distribute, prior to the beginning of the enumeration, to every rural boxholder, except those in a selected area in the South, a copy of the questionnaire for the 1950 Census of Agriculture with a request to the boxholder that these questionnaires be filled and given to the census enumerator when he calls.

Tests on the self-enumeration procedure were conducted in a special census in four rural counties last fall. Notwithstanding the fact that this was a special census and reporting was not obligatory, a rather high rate of cooperation was obtained. The per-

centage of the farms for which the questionnaires were filled either completely or almost completely, ranged from 39 to 51 percent. The percentage of cases in which the respondents had not filled any part of their questionnaires, so that the enumerator had to do the complete job of filling the questionnaire ranged from 42 down to 32 percent. With this rate of cooperation, the average enumeration time for all farms was reduced from about 40 minutes for the areas in which self-enumeration was not tried to about 20 minutes in areas in which it was.

In 1950, it appears reasonable to hope that about the degree of cooperation observed in the pretests can be expected in areas that have about half of the farms in the United States. In the remaining areas, in which the literacy rate of farmers is lower and the enumeration problems are more difficult, only a small gain may be realized through self-enumeration. In fact, in the multiple-unit area of the South, it is not planned to make any advance distribution of questionnaires by mail.

Plans to use sampling in the 1950 Census of Agriculture represent a significant change in procedure from that used in prior decennial censuses. Information on farm equipment, farm facilities, farm expenditures, farm labor, farm values, farm mortgages, and farm taxes will be collected for only one out of five farms, plus about 40,000 large farms. The determination as to which farms are to be the sample will be based upon whether or not the questionnaire has a specified number and the number assigned to the enumeration district. Questionnaires will be numbered from one to five and all questionnaires having a number corresponding to the last digit of the enumeration district will be in the sample. The use of sampling will reduce both the enumeration and tabulation costs for the Census of Agriculture.

Training of Enumerators

The rural enumerators will be given approximately 24 hours of training before they begin their actual enumeration. The detailed training for the Census of Agriculture will represent slightly more than one-third of the total training time. The training program will teach the enumerator the step-by-step procedure for doing his work, and will give him the essential facts he needs to know in order to carry out his assignment efficiently and accurately.

Emphasis in the training will be placed upon practice enumeration in the classroom, use of role-playing interviews, problem-

solving exercises and filling questionnaires from recorded interviews. In addition, each enumerator will be given, after the second day of training, a home assignment of preparing a questionnaire for his own or a neighboring farm. Before the last day of training the enumerator will perform one-half day of actual enumeration. Questionnaires filled at home and those obtained during the one-half day of enumeration will be reviewed, and discussed with the enumerator. The training will be continued during the first two days of actual enumeration. Present plans call for only half the enumerators to start their enumeration on the first day of the enumeration period and the other half to begin their enumeration on the following day. During the first day of enumeration for each group it is planned to have the crew leader see all the enumerators who began that day and to have him accompany, on at least one interview, the two enumerators that he considers the weakest.

The materials to be used for training of enumerators will be standardized and the crew leader will be required to follow a fixed time schedule in conducting the training. In order to reduce the monotony of the training and increase the effectiveness of the presentation of essential instructions, training materials for the Census of Agriculture will include three film strips presenting basic concepts and definitions.

It is axiomatic that the results of the census can be no better than the work performed by the individual enumerator. It is believed that the training program for enumerators will result in decided improvement in the quality of the census.

Noteworthy steps have been taken to provide for supervision of enumerators during the taking of the census. Present plans call for the use of approximately one local supervisor or crew leader for every 14 enumerators in rural areas. These crew leaders will be recruited approximately four weeks in advance of the census date. They will be given a full week of training on the requirements and the procedures of the census.

The crew leaders will conduct the training for the enumerators for whom they will be responsible during the census. Prior to the actual beginning of the census, the crew leader will spend several days inspecting the maps to be used by the enumerators, visiting the area to be enumerated for the purpose of clearing up any questions regarding boundaries of enumeration districts, and familiarizing himself with any problems that may arise during the conduct of

enumeration. During the actual enumeration period he will visit his enumerators as they are conducting the enumeration, inspect their questionnaires on a systematic basis and answer any questions that they may have. In the early stages of enumeration the crew leader will be expected to accompany each of his enumerators on at least one interview. In general, the crew leader will be expected to visit the enumerators at least twice every week and to make a detailed check of approximately 20 percent of the questionnaires they have completed. At the completion of the enumeration of a given area, a crew leader will be expected to check the work and map of the enumerators to see that the coverage has been complete. This program of supervision represents one of the most promising developments aimed toward improving the basic quality of data collected in the Census of Agriculture.

Several important steps are being planned to improve the completeness of the coverage of the agricultural census. The first of these steps relates to the kind of places for which census enumerators will be required to fill questionnaires. It is becoming increasingly difficult for census enumerators to recognize farms or places that should be enumerated in the farm census. In recent censuses, enumerators have been instructed to enumerate as farms all places containing three or more acres on which any agricultural products were produced and also all places under three acres on which \$250 or more of agricultural products were produced during the year preceding the census. Enumerators have had difficulty in applying these instructions particularly because for places under three acres it was necessary to determine the value of agricultural products. Also, in past censuses, enumerators have not uniformly applied the instructions regarding the enumeration of places of three or more acres.

For 1950, the enumerator will be required to ask for each dwelling in rural areas, "Is this house on a farm?" and to record the answer. If the answer to this inquiry is "No" the enumerator will be required to ask, "Is this house located on a place of three or more acres?" If the answer to either of these questions is "Yes" the enumerator will be required to fill an agriculture questionnaire for the place. Moreover, the enumerator will be asked to enumerate all places under three acres if locally considered as farms, and also all nurseries, greenhouses, apiaries, and places producing poultry and eggs primarily for sale.

Tentative plans are to include in the tabulations only those

places of three or more acres on which the value of agricultural products produced during 1949 amounted to \$150 or more. Special rules will need to be developed for farms being operated for the first time in 1949, farms on which all crops failed, etc. Only those places under three acres having a value of products sold of \$150 or more, will be retained in the tabulations. In order to have consistency from census to census, it is planned to vary the \$150 limit in accordance with changes in the price level.

Another important step being taken to improve the completeness of coverage is the use of lists of large farms. The criterion adopted for determining whether or not the farm is large varies somewhat from area to area, but, in general, any farm that has 1,000 acres of land, or 750 acres of cropland, or 200 cattle, or 600 sheep, or a value of products sold of \$70,000 or more is considered a large farm. A list of the large farms enumerated in the 1945 Census has been prepared and copies of this list have been sent to State Statisticians for checking against lists of farms obtained in State farm censuses, lists of large producers, lists of farms included in county soil conservation and other programs. This checking is expected to provide a rather complete and up-to-date list of large farm operators. These lists will be given to crew leaders and they will be required to check upon the enumeration of the farms included on these large farm lists. This procedure will help insure the complete enumeration as well as prevent the enumeration more than once of large farms with land in more than one enumeration district.

Two other procedures for improving the completeness of coverage will be used in the South or the West. The enumeration of "multiple-unit farms" or farms with croppers in the South has always presented serious problems. In order to improve the enumeration of multiple-unit farms, it is planned to use a special Landlord-Tenant Operations Questionnaire in the multiple-unit area of the South. This questionnaire provides for a report on the over-all operations of the multiple unit, a listing of the croppers and other tenants on the multiple unit together with the acreage assigned each and the acreage and production of the crops on the assigned land in 1949. This questionnaire is to be filled by the census enumerator before he fills separate agricultural questionnaires for each of the sub-units of the multiple unit. This procedure will aid in preventing duplication in the enumeration of parts of the multiple units and will provide data for filling the individual agriculture question-

naires in case the operator next April is on a newly assigned acreage and does not know the facts regarding the use of land, crops, etc., for the farm in 1949.

In the West, the use of grazing lands under a permit system presents some difficult problems in obtaining complete coverage of land. Inasmuch as farmers do not know the area of grazing land used under permit, and as several operators often have permits covering the same land, it has been determined that it is not feasible to include grazing-permit lands as a part of the farm or ranch. In order to insure that grazing-permit lands are not included in the farm area and to provide a check on the coverage of persons holding grazing permits, a question on use of grazing-permit lands will be included on the questionnaire for the Western States.

Widespread publicity will be another aid employed in improving not only the completeness of coverage, but also the quality of the census. It is planned to make widespread distribution of information about the census in order to prepare persons for the visit of the census enumerator. The distribution of the Agriculture Questionnaire and its accompanying letter by mail prior to the beginning of the enumeration will contribute greatly to the knowledge of persons living in rural areas regarding the census.

Tabulation and Publication of Results

Present plans call for the tabulation of all items except those obtained only for a sample of farms by minor civil division. Data obtained on a sample basis, except those for farm mortgage debt, farm wage rates, and farm taxes would be tabulated by counties. These tabulations would provide totals for most items for each county and it is planned to publish such county totals. Tabulations and published county totals would provide separate data on farms and crop acreage and production for irrigated and non-irrigated farms in the Western States. Data on land use, the acreage and production of principal crops and on the number of the important kinds of livestock would be available by minor civil division, and such data would be made available, as in past censuses, upon the payment of the cost of making photostat copies of the tabulations.

It is planned to tabulate and publish a considerable amount of data for areas larger than counties. All the cross tabulations by size of farm, color and tenure of farm operator, type of farm, and economic class would be made and published for groups of counties comprising type-of-farming areas. These type-of-farming areas

would be essentially those developed by the Bureau of Agricultural Economics in cooperation with State Colleges.

The classification of farms by size and by color and tenure of operator has been made for several prior censuses. The proposed classification of farms by type of farm and by economic class differ considerably from those made in prior censuses and a description of these classifications appears desirable.

The first attempt of the Bureau of the Census in classifying farms was made in connection with the 1945 Census of Agriculture. Several changes in the 1945 bases for the economic classification of farms are being considered for the 1950 Census. The value of farm products sold instead of the gross value of farm products sold and used by the farm household as the major criterion for the determination of economic class has already been decided upon. In the 1945 experimental classification, the characteristics of farms in the part-time, residential, and small-scale classes do not differ greatly. The proposed inquiries regarding the relative importance of farm and nonfarm sources of income will aid in a more accurate separation of part-time and small-scale farms in 1950.

Changes in price level require also an adjustment in the 1945 criteria for the economic classification of farms in order to provide more adequate comparability through time. Value of sales in terms of dollars fluctuates considerably from census to census because of changes in price levels and yield conditions. This will be partially remedied by change in the 1945 value-of-products criteria.

At the present time the tentative economic classes of farms and the criteria to be used are as follows:

Economic class	Value of products sold	Days of work off the farm by farm operator	Income from non-farm sources greater than value of farm products sold
Commercial farms			
Group A	\$25,000 or more	—	—
Group B	\$12,000-\$24,999	—	—
Group C	\$ 5,000-\$11,999	—	—
Group D	\$ 2,500-\$ 4,999	—	—
Group E	\$ 1,000-\$ 2,499	—	—
Small-scale farms	\$ 200-\$ 999	Less than 100	No
Part-time farms	\$ 200-\$ 999	100 or more or	Yes
Residential farms	Under \$200	—	—
Abnormal farms	This group would include institutions (farms operated by schools, colleges, Federal, State, and local Governments), country estates, and other farms with no farm products sold.		

The classification of farms by type will be made only for those farms that have been classified by economic class as commercial farms, small-scale farms, and part-time farms. Residential and abnormal farms will not be classified by type.

In general, type of farm will be determined on the basis of the relationship of the value of farm products sold from one source to the total value of all farm products sold. Generally, the source accounting for 50 percent or more of the total sales will determine the type. Tentative plans call for the establishment of the following twelve types of farms:

Type of farm	Criteria
1. Cash-grain farms	50% or more of total sales derived from the sale of corn, sorghums, and small grains.
2. Cotton farms	50% or more of total sales derived from the sale of cotton and cottonseed.
3. Crop-specialty farms	50% or more of total sales derived from the sale of a single field crop other than corn, sorghums, small grains, cotton, vegetables, and fruits and nuts.
4. Vegetable farms	50% or more of total sales derived from the sale of vegetables.
5. Fruit-and-nut farms	50% or more of total sales derived from the sale of fruits and nuts.
6. Poultry farms	50% or more of total sales derived from the sales of poultry and poultry products.
7. Dairy farms	50% or more of total sales derived from the sale of dairy products, dairy cattle and calves.
8. Livestock-specialty farms	50% or more of total sales derived from the sale of one kind of livestock such as sheep (including wool), cattle and calves (other than dairy) or hogs.
9. General-crop farms	Less than 50% of total sales derived from any single source (such as cash grains, cotton, etc.) but 70% or more of total sales derived from the sale of all crops.
10. General-livestock farms	Less than 50% of total sales derived from the sale of poultry, dairy, or livestock-specialty products, but 70% or more of total sales derived from the sale of all livestock and livestock products.
11. General-crop and livestock farms	Less than 50% of total sales derived from the sale from a single source but with less than 70% of the total sales derived from the sale of crops and less than 70% of the total sales derived from the sale of livestock and livestock products.
12. Miscellaneous farms	This group will include farms not included in the other 11 groups and will comprise such types of farms as forest products, horticultural-specialty, fur farms, etc.

The publications planned for the next census will contain an appraisal of the results of the Census of Agriculture. This appraisal

will be based, in part, on a recheck of the enumeration of a sample of 6,000 to 8,000 farms. This size of sample will be sufficient to provide an accurate evaluation of the completeness of coverage within one percent of the total number of farms. This recheck will not only provide estimates of the completeness of coverage of farms and land in farms but also furnish data that will help evaluate the accuracy of other important items.

The appraisal will also deal particularly with the comparability of various items for several censuses. It will include a discussion of the incompleteness of the enumeration, where this is known to exist, the extent of any estimating involved in presenting the final results, and the basis on which any such estimates were made.

It is believed that this appraisal will help overcome technical criticism of the census and will lead to much more accurate use of its results. It is hoped that self-criticism and analysis of the accuracy of the census will gain for it a higher standing among research and scientific workers.

DISCUSSION

P. J. CREER
Montana State Statistician

As one who appreciates the value of census data, I am pleased with the opportunity to express some observations regarding the plans for the forthcoming census of agriculture disclosed by Mr. Hurley.

State statisticians are interested in the 1950 Census of Agriculture from the viewpoint of type of information to be enumerated, completeness and accuracy of the recorded data and coverage of the farms and ranches of the state. Basic to these points are the design of the questionnaire, enumerator selection and training, methods of enumeration and checks and measurements of coverage. The following observations place emphasis on these points.

The interview type of questionnaire to be used for the forthcoming census of agriculture is a marked improvement over the record type questionnaires used in the past. Questions worded in a simple, clear and descriptive manner should draw from the respondent correct answers for most items. The Census questionnaire used in the May 1949 pre-test has undergone considerable modification in layout as well as wording of questions. The final draft, with many sections shifted to other positions, will present better sequence of the questions relating to similar subjects.

Narrow regionalization of the questionnaire greatly reduces the number of questions to be considered. This will contribute to the accuracy and completeness of reported information and also lower enumerative costs.

Much of the accuracy, completeness and coverage of the enumeration rests with the type of enumerators used and the kind of training they have. Rather intensive studies have been made of the performance and quality of work of interviewers. Young women raised on a farm or who had lived on a farm for several years proved to be the best interviewers. Enumerators with farm backgrounds would be more likely to cover all farms and ranches in the district than enumerators from the city whose travels seldom take them off State and Federal highways.

Modification of the questionnaire from the record to the interview type has an additional advantage of permitting self-enumeration. Questionnaires are to be distributed through the mail to farm and ranch operators and in due time the enumerators will contact the operators, check through the questionnaires for accuracy and completeness and fill in information not already recorded.

Widespread publicity is to be given the Census to improve its coverage and quality. In the course of this publicity it may be effective to request that operators who do not receive questionnaires by mail at a specified date appear at a designated office and obtain questionnaires for self-enumeration.

Mr. Hurley has outlined the plans to assure more complete coverage of multiple unit farms and also those which use grazing lands under a permit system. A large portion of the land in western states is operated under rental agreements and many farms are comprised of two or more tracts of land which may be widely separated. If complete coverage is to be obtained, it may be necessary for enumerators to account for all of the land within the borders of their districts by thorough mapping.

Constant changing of land from one operator to another induces a problem in the enumeration of land use and crop information in western states. This problem was recognized and discussed by most of the observers of the May 1949 pre-test. The first question under the land use section of the questionnaire asks for "acres in this place" which are to be the same as the acres in the operator's charge at the time of the enumeration. This acreage is also to be the same as that covered in the land use categories for the year 1949. Included in the land use section is a question asking for acres of land from which crops were harvested in 1949 and these acres are expected to be the same as the total of the acres entered under the crops section of the questionnaire. There will, undoubtedly, be many cases in Montana and other western states where land operated in 1949 will differ from the land in the charge of the operator next spring. Mr. Hurley has indicated that by use of a special landlord-tenant operations questionnaire the enumeration of multiple unit farms in the south may be improved. It would be well to use a similar questionnaire in most of the western states.

The mid-decennial Census of Agriculture timed as of January 1 eliminates much of the confusion of shifting acreages in farms and also reduces the amount of memory bias. Furthermore the majority of farmers and ranchers operate on a calendar year basis. They have on hand January 1 livestock numbers, totals of income and expenses and other data for income tax purposes. These data would be useful and timely in filling out the census

schedule. Thus a January 1 enumeration appears to have many advantages over the 1950 enumeration date which is to begin April 1.

During recent years the need for good irrigation statistics has increased sharply.

The irrigation section of the 1950 census questionnaire does not provide for a listing of acreage and production of crops for which part of the acreage was irrigated in 1949.

The livestock industry in western states is comprised principally of large scale ranching operations. With the census enumeration timed for April 1, 1950, enumerators should be able to locate owners or operators at their home place. Reference to assessor's records and also to files of the various Federal agencies controlling public domain will, undoubtedly, be helpful in obtaining complete coverage of western livestock operations.

DISCUSSION

JOE R. MOTHERAL
A & M College of Texas

My interest is centered on research uses of Census data, so I should like to mention three of the most important values of the Agricultural Census to the researcher.

First, the Census is highly suggestive of problem areas in the agricultural economy and is therefore influential in the formulation of research projects. Second, it is logically and widely used as a sampling base for intensive studies. And third, it provides a check every five years on those studies which are concerned with trend analysis. For these reasons, and because the Census is an established public undertaking of rather sizeable proportions, the agricultural economist tends to assume a proprietary attitude toward it and to reserve unto himself the privilege of full, free, and perhaps at times noxious, criticism of the methods pursued by the Bureau of the Census in collecting, processing and publishing its data.

In his paper Mr. Hurley implicitly accepts this universal tenancy in common and enumerates the ways in which his Bureau has encouraged it, to the end that a more acceptable and useful product may be the result. A deliberate effort has been made to obtain the advice of representatives of the farm organizations, the agricultural press, and the state commissioners of agriculture.

It is the thesis of these comments that while the agricultural economist is correct in asserting his right to criticize Census techniques, he has the responsibility of contributing to their improvement. We have accepted the right with greater alacrity than the responsibility. A case in point is the matter of enumerating the multiple unit, or plantation, in the South. Most Southern agricultural economists yield to no region in their condemnation of the traditional Census classification of farms. Some consider it simply to be an anachronism which the Bureau is unwilling to discard, others as a concession to easy enumeration; and there is one steadfast group which

takes the dark view that it is sheer discrimination resulting from the indecisive nature of the Confederate victory in the Civil War.

In 1910 the Bureau of the Census offered a partial remedy in the form of a report entitled "Plantations in the South" which summarized data for farms having five or more tenants. A plantation schedule was used in 1940, but the results were evidently unsatisfactory, as the data have not been published. Again in 1945 an attempt was made to collect and summarize information on "Multiple Unit Operations." Among the other limitations of this material is that of lack of comparability, for the definition of a multiple unit in 1945 involved *any* operation consisting of two or more sub-units including those of cash, standing rent, and share tenants.

Since 1945 the Bureau has made a strenuous effort to overcome this deficiency in time for the 1950 Census, as those of us who assisted in the field pretests can testify. However, it is an open question whether the schedule presently proposed for 1950 will do the job.

Admittedly, the solution to this problem is not simple. It requires a reconciliation of the intricate characteristics of the Southern tenure system, on the one hand, with the pressing limitations of time, schedule space and the capacity of the Census enumerator on the other. Most Southern agricultural economists, I believe, need to have a clear-cut enumeration of operating units which would be meaningful and uniform for the region, and which would assure comparable data from one Census to the next.

An admirable illustration of how to hold a firm grip on this statistical cake, while eating it, has been furnished by the summarization of farms into "economic classes." This exceptionally useful classification required no modification of existing methods of enumeration and hence involved no breach in continuity. Yet it represents an adaptation that meets a long-standing need for students of significant trends in the agricultural economy. It is worth noting that the proposal for this addition to Census material originated outside of the Bureau but was readily accepted and incorporated into the 1945 Census.

The final objective of the consumer of agricultural statistics might well be an annual census with sufficient coverage to provide reliable data for small areas. Considerable progress has been made toward such a goal during the last few years.

DISCUSSION

R. S. OVERTON
Iowa Field Office BAE.

The Census Bureau is to be highly commended for their energetic efforts to make extensive improvements in all phases of their work. In conjunction with their program of inviting assistance from outside sources, the Census people themselves have aggressively tackled their problems with the view of adopting or devising new techniques that would improve the quality and utility of their data.

Several specific improvements should be cited. One of the most impor-

tant is the nearly complete regionalization of questionnaires on a state basis.

Another change in the procedure is the standardized training program that has been worked out. The combination of film strips and recordings is a significant step toward uniformity and should go far toward improving the reliability of the census enumeration.

The proposed self-enumeration plan is basically sound and represents another achievement.

The Bureau is making every effort to formulate realistic classification and type criteria that will maximize the value of the tabulations. These standards have not yet been fixed and since the Bureau is inviting comment it would seem that there still is an excellent opportunity for all of us to offer constructive advice as to how we would like to see the results published.

In the future, I would like to see a census study committee, composed of personnel from B.A.E., P.M.A., the state colleges, the State Department of Agriculture, the Extension Service, business groups and representatives of farm organizations set up in each state. This group would function much the same as the national advisory committee except that they would be concerned with the work in a particular state.

The time of taking the Federal Census of Agriculture needs to be re-examined. In my opinion the information should be obtained in December or January, at least it should be as close to the first of the years as possible. Obviously there are some drawbacks to an earlier enumeration, but I feel the advantages outweigh the disadvantages.

It is my opinion that dollar value figures are still regarded by rural people as highly personal information and they resent being questioned about them. Further, many crop share tenants do not know how much their landlord received from the sale of his portion of the crop. In short I am rather dubious about all of these "values of sales" questions and I would like to raise the point that their inclusion may result in serious downward bias in the reported figures of both dollar values and units sold. This influence may go even further and tend to distort reported production figures.

PROCEEDINGS OF THE ANNUAL BUSINESS MEETING
AMERICAN FARM ECONOMIC ASSOCIATION
LARAMIE, WYOMING, AUGUST 20, 1949

President O. V. Wells called the meeting to order at 8:30 A.M. He asked for the reports, in turn, of the Committee of Election Tellers, the Secretary-Treasurer, the Auditors, and the Editor. These reports were presented and are appended. A motion to accept these reports was approved.

President Wells reported the arrangements for joint meetings with the American Economic Association and related organizations in New York in December.

The President announced the appointment of a committee consisting of A. J. Brown, M. C. Bond, and D. Barton DeLoach to cooperate with the American Marketing Association.

Wells reported that he had been unable to form a committee to make special awards at this meeting. Several prominent members were asked, but refused, to serve as chairman of such a committee. However, E. C. Young, Warren Waite, and F. V. Waugh served as a committee to make recommendations as to procedures for making special awards.

The President discussed the prospective deficit in the Association's budget for the current and next fiscal years. He pointed out that publishing the JOURNAL is the greatest item of expense but advised against reducing the size of the JOURNAL. The executive Committee has authorized the publication of 1,200 pages, including 400 pages for the proceedings of the annual meeting.

Several members spoke of the necessity for the Editor to cut proceedings papers to fit the limited space in the JOURNAL. There was no dissent.

A motion to supply authors with reprints of proceedings papers at cost was approved.

A motion to charge a registration fee of not less than one nor more than two dollars at future annual meetings was approved.

The President discussed the need for greater continuity of officers in the management of the affairs of the Association. He gave special emphasis to the need for some specific preparatory experience for the President. In order to provide for such experience, the Executive Committee recommended the adoption of the following amendment to the Constitution.

Article IV

Organization. The officers shall be a President, a President-Elect, two Vice-Presidents, and a Secretary-Treasurer, who shall be elected for one year, and who shall serve until their successors shall qualify. In case of incapacity of the President to act, the Vice-President receiving the highest number of votes shall act as President. *The President-Elect shall be a member of the Executive Committee in full standing and automatically become President the year following his election as President-Elect.*

The Executive Committee shall consist of the active officers, *including the President-Elect*, the latest two past Presidents, and may include the President of any national or regional association with which the American

PROCEEDINGS OF THE ANNUAL BUSINESS MEETING 1299

Farm Economic Association has entered into joint membership arrangements. It shall appoint annually the Editor of the JOURNAL OF FARM ECONOMICS. It may adopt rules and regulations for the conduct of its business not inconsistent with the constitution of the Association, or with rules adopted at the annual meeting. It shall act as a committee on time and place of meetings, and perform such other duties as the Association shall delegate to it.

There shall be a standing committee on investment policy with respect to Association funds. The Secretary-Treasurer shall be a member of this committee. He shall have authority to acquire, sell and transfer property for the Association. The actions of this committee shall be subject at all times to review by the Executive Committee.

The President, Vice-Presidents, and such other members as the President may appoint shall constitute a committee on the preparation of a program for the annual meeting. The President shall act as chairman of this committee.

Special committees may be appointed in accordance with the needs of the Association. Special committees and the investment committee shall be appointed by the President with the approval of the Executive Committee.

(As amended 12-28-1946)

Article V

Election of Officers. The President and the two preceding past Presidents shall constitute a nominating committee. The President shall act as chairman of the committee.

Two nominations shall be made for each office except for Secretary-Treasurer, for which one nomination shall be presented. No person who has served a term as President shall be nominated for that office or eligible for election to it. *For the year ending in 1950, the ballots shall provide for the election of both a President and a President-Elect. Thereafter the ballots shall omit the office of President.*

Not later than 30 days before the annual meeting of each year, the Secretary-Treasurer shall mail a ballot to each member of the Association who has paid dues for the current year, not including corporations, libraries, or other institutions. Said ballot shall provide for a vote for each elective officer. For each office the ballot shall contain one blank line. A brief biographical sketch of each nominee shall be included.

The proposed amendment was approved.

There being no further business to be transacted, the meeting was adjourned.

L. H. SIMERL, *Secretary-Treasurer*

REPORT OF THE SECRETARY-TREASURER

The secretary-treasurer spent considerable time becoming familiar with the duties and responsibilities of his office. Among other things this served to increase his appreciation of the work of those who performed these duties in previous years.

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Membership. The strong upsurge in membership that began a few years ago apparently has subsided. Last December the secretary-treasurer reported an all time high of 2,006 members and subscribers. Our latest count, made in connection with the mailing of the election ballots, showed a decrease of approximately two and one-half percent from the last December figure.

The Association is confronted with a serious membership and financial problem. This problem has five alternative solutions. These are: (1) cut services to members; (2) finds ways of providing present services at reduced cost; (3) increase membership dues; (4) draw upon reserves; (5) increase the number of members.

A Committee on Policy faced this problem in 1948, and reported at the last annual meeting. At that time the committee, consisting of Frederick V. Waugh, Chairman, L. J. Norton and E. L. Butz, recommended against curtailing our program or raising dues and said: "Our greatest need is for new members."

Finances. From December 1 to July 30 our operating expenditures have exceeded income by \$1,086.01. In addition, we accumulated a liability for clerical services in the secretary-treasurer's office amounting to \$875. This makes a total deficit for the first eight months of our budget year of \$1,961.01.

Figures presented at the last annual meeting are not exactly comparable to these as they covered a period of nine months instead of eight. However, for the first nine months of the fiscal year 1948 income exceeded expenditures by \$1,817.76.

Thus, where we had a surplus of \$1,817.76 to September 1 last year, we have a deficit of \$1,961.01 to August 1 this year. This switch from a substantial surplus to a substantial deficit should receive careful consideration from the members and the Executive Committee.

The change from black ink to red is accounted for by increased operating costs on the one hand and reduced income on the other. Operating costs have increased with the general rise in prices, and also on account of the large increase in membership last year. The dues paid by the new members appeared as income in 1948, but much of the expense of servicing them occurred in 1949. Many of the new members failed to renew their membership this year.

A summary of our receipts, expenses, and cash balances follows:

SUMMARY OF RECEIPTS, EXPENSES, AND CASH BALANCES DECEMBER 1, 1948 TO JULY 30, 1949

Cash balance, November 30, 1948.....	\$ 6,035.16
Income	
Special grants.....	\$1,000.00
Dues and other income.....	9,253.64

Total.....	\$10,253.64

	\$16,288.80

PROCEEDINGS OF THE ANNUAL BUSINESS MEETING 1901

Expenses	
JOURNAL printing.....	\$8,985.37
Other expenditures.....	1,354.28
Total.....	\$10,339.65
Cash balance July 30, 1949.....	\$ 5,949.15

Investments

No changes have been made in the investment portfolio since the end of the fiscal year, November 30, 1948. At that time the investments were valued at \$61,744.85.

Special Grants Fund

The reserve for special grants amounts to \$14,425.00 plus accumulated earnings since December 1, 1948.

A summary of the financial results and membership records will be prepared at the end of this fiscal year, November 30. It will appear in the February 1950 issue of the JOURNAL.

In accord with a resolution adopted by the membership at the 1948 annual meeting the fiscal year beginning next December 1, will end on June 30, 1950.

Respectfully submitted,
L. H. SIMERL,
Secretary-Treasurer

REPORT OF THE AUDITORS

As requested by the President of the American Farm Economic Association, we have examined the accounts of the Secretary-Treasurer, L. H. Simerl, for the period ending July 30, 1949. We found that the books were kept by the retiring Secretary-Treasurer, L. J. Norton, for the period October 30-December 22, 1948. The assets of the Association were checked by examining bank statements and inspecting the stock certificates and bonds kept in a safety deposit box in the First National Bank, Champaign, Illinois. We have checked cancelled checks, bank debit slips, vouchers, and bank statements with expenses as shown in the treasurer's account and found the book statement of expenses correct.

We have checked bank deposit slips, bank credit slips, and bank statements with receipts as shown in the books, and found the book statement of receipts correct. We checked the bank balance on July 30, 1949 with the books and found them in agreement.

The books of the Association have been carefully and correctly kept, and we certify that the financial statement made by the Secretary-Treasurer reflects the financial situation and the transactions of the Association as shown by his records.

Respectfully submitted,
H. C. M. CASE AND
N. R. URQUHART, *Auditors*

1302 PROCEEDINGS OF THE ANNUAL BUSINESS MEETING

MINUTES OF THE EXECUTIVE COMMITTEE, AMERICAN
FARM ECONOMIC ASSOCIATION, LARAMIE, WYOMING,
AUGUST 17, 18, AND 19, 1949

President Wells called the meeting to order at 10:00 A.M. Those present were: O. V. Wells, Bushrod Allin, T. K. Cowden, Asher Hobson, H. R. Wellman, S. C. Hudson, and L. H. Simerl. Also present later were Walter Wilcox and the President-Elect, Warren Waite who presided at the meeting on the 19th.

The minutes of the latest previous meeting of the committee were approved.

The Committee agreed to invite ten persons who rendered special services essential to the success of this annual meeting to be guests of the Association at the banquet.

A motion authorizing the President and the Secretary-Treasurer to fix the amount of the bonds for the latter officer and his secretary was approved. The Committee suggested \$10,000 and \$5,000, respectively.

The President reported that he had been unable to form a committee to begin the special awards program this year. He said that E. C. Young, F. V. Waugh, and Warren Waite had been appointed and had served as a committee to make recommendations as to how such a program might be administered. The report of this committee was received and referred to the President-Elect.

Bushrod Allin reported on problems and progress in the organization of student sections or chapters. The Committee agreed that the AFEA should encourage and advise with student organizations interested in agricultural economics, but should not undertake to issue charters, approve constitutions, or otherwise intervene in the management of these organizations. It was further agreed that undergraduate students should be accepted for membership in the Association on the same basis as graduate students, that is, upon certification by the head of the department giving instruction in agricultural economics and the payment of an annual membership fee of \$3.00.

Dr. Hudson, on behalf of the Canadian Agricultural Economics Society, invited the Association to hold its annual meeting in Canada in 1951.

Dr. Cowden, on behalf of the Michigan State College, invited the Association to meet at East Lansing in 1951 or any succeeding year.

E. C. Young reported on the possibility of the International Conference of Agricultural Economists being held in the U.S.A. in 1951. In that event the AFEA should consider the advisability of coordinating its annual meeting with that of the International group.

Mr. Wells reported on arrangements for joint meetings with the American Economic Association and related societies in New York in December.

The Committee agreed to recommend to the members that a registration fee of \$1.00 be charged at the next annual meeting. This would help meet expenses of the meeting and balance the budget.

The Secretary-Treasurer was instructed to prepare membership and financial reports as of June 30, 1949 that can be used for comparative purposes for the fiscal year ending June 30, 1950. He was also requested to prepare and publish comparative reports as of the end of the current fiscal year.

PROCEEDINGS OF THE ANNUAL BUSINESS MEETING 1303

Walter W. Wilcox was appointed Editor of the JOURNAL for the next year.

In order to furnish transfer officers of corporations with the necessary evidence that the Secretary-Treasurer is authorized to transfer securities in the name of the Association, the following resolution was adopted.

"RESOLVED, that the Secretary-Treasurer (L. H. Simerl of Urbana, Illinois) who is also Chairman of the Investment Policy Committee, be and is hereby authorized and empowered, for, and in the name and on behalf of this Association to take any and all such steps, and to do any and all such things, as may be necessary, required, and appropriate for, or in connection with, the purchase, acquisition, acceptance, handling, pledging, sale, or other disposition of stocks, bonds, and other securities belonging to the Association or pertaining to its business, including the execution, and delivery for and in the name and on behalf of the Association, of any and all endorsements, transfer and assignments of certificates of stock, bonds, or other securities standing in the name of this Association, either for the purpose of sale or transfer, and all such other steps and actions as may be necessary or proper in connection herewith."

The President was authorized to proceed with the special awards program as previously recommended by the Committee, except that the awards for published research consist of three awards of \$250 each.

It was agreed that the 1950 annual meeting would be held at Montreat, North Carolina.

The President, or someone to be named by him, was authorized to go to Montreat to make necessary arrangements for the meeting.

The Executive Committee directed the Secretary-Treasurer to change the membership to a calendar year basis as rapidly as practicable. This change is desirable in the interest of economy and budgeting.

It was agreed that a directory, if prepared, should be sold to members at cost.

Methods of increasing revenues were discussed. These included increased sale of subscriptions to commercial concerns, increased membership in foreign countries, and the sale of more advertising in the JOURNAL.

The Committee agreed to recommend to the membership an amendment to the constitution to provide for the election each year of a President-Elect who would serve as a member of the Executive Committee for one year before becoming President.

The Secretary-Treasurer presented a report indicating a probable deficit of \$1,100 for the fiscal year ending November 30.

Budget estimates for the next twelve-months' period were approved as follows:

Income

Dues and subscriptions.....	\$9,000
Sale of back numbers.....	500
Sale of JOURNAL reprints.....	300
Dividends and interest.....	2,000
Advertising.....	100
	<hr/>
Total Income.....	\$11,900
Deficit.....	1,100
	<hr/>
	\$13,000

1804 PROCEEDINGS OF THE ANNUAL BUSINESS MEETING

Expenditures

Printing JOURNAL.....	\$9,000
Reprints.....	600
Annual meeting.....	300
Back numbers.....	200
Best article award.....	100
Editorial expense.....	750
Library custodian.....	30
Office supplies.....	120
Postage and wires.....	200
President's expense.....	150
Secretary's expense.....	1,550
	\$13,000

The Executive Committee on behalf of the membership adopted the following resolution expressing appreciation to Dr. Vass and the staff of the University of Wyoming.

"The Association takes this means of expressing our sincere appreciation of the many and varied efforts of the staff of the University of Wyoming which made possible not only the largest, but one of the most pleasant series of meetings in this our first, but we hope not our last, joint session with the Western Farm Economic Association."

There being no further business to come before the Committee, the meeting was adjourned.

L. H. SIMERL, Secretary-Treasurer

REPORT OF THE ELECTION TELLERS

We, the undersigned election tellers, report that we have counted the ballots cast for the Association's officers for the year 1949-50. The officers elected are as follows:

President.....	Warren C. Waite
Vice-President.....	Joseph Ackerman
Vice-President.....	K. H. Parsons
Secretary-Treasurer.....	L. H. Simerl

Respectfully submitted,
(Signed) **BUSHROD W. ALLIN**
T. K. COWDEN

ANNOUNCEMENT OF AWARDS FOR MERITORIOUS RESEARCH IN AGRICULTURAL ECONOMICS

During the year 1948, the special grants committee of the American Farm Economic Association solicited funds from business firms and enterprises for the purpose of establishing a fund from which awards could be made for meritorious research. At the time of the annual meeting in September, 1948, Chairman Julius Hendel reported that \$12,925 had been contributed towards this fund. Following this date the committees of the Farm Economic Association have been at work developing a plan by which special awards could be made out of this fund.

At the annual meeting of the Association in Laramie in August, 1949, a program was adopted for making the first awards during the year 1949-1950. Following is a brief statement of the conditions under which these awards will be given.

There are two types of awards: (1) For published reports of research in the field of Agricultural Economics, and (2) For theses submitted in partial fulfillment for the degree of Doctor of Philosophy in departments administering majors in Agricultural Economics.

Awards for Published Reports of Research in Agricultural Economics

1. For the year 1950 there will be three prize awards of \$250.00 each. Each award will be in a different field of Agricultural Economics.

2. Papers which are submitted will be classified in the following fields and persons submitting the papers should indicate the field in which they believe they should be classified.

- (a) Farm management and production economics
- (b) Agricultural marketing
- (c) Agricultural prices
- (d) Agricultural finance
- (e) Land economics
- (f) Theory and methodology
- (g) Agricultural policy

3. Selections will be made from published research bearing the publication dates of 1947, 1948, and 1949.

4. Only papers submitted by persons 40 years of age or less at the time of publication will be considered.

5. The prize awards committee will be made up of seven persons representing the various fields which have been designated. All will be members of the American Farm Economic Association.

6. Papers should be in the hands of the Chairman of the committee, E.C. Young, Purdue University, on or before February 1, 1950.

7. Members of the prize awards committee will not be eligible to submit papers of their own.

8. Announcement of the awards will be made on or before the time of the 1950 annual meeting of the American Farm Economic Association.

Awards for Doctor's Theses

1. For the year 1950 the awards will be as follows: (a) First award will be \$250.00, and (b) two special awards of \$100.00 each.
2. Theses in any field of Agricultural Economics may be submitted. Theses prepared by candidates for the Ph.D. degree in any department of Economics or Agricultural Economics in the United States are eligible for consideration.
3. Selections will be made from theses submitted during the calendar years 1947, 1948, and 1949.
4. The head of each department of Agricultural Economics or Economics in the United States where Ph.D. programs are administered will be eligible to submit one thesis.
5. Theses should be in the hands of the Chairman of the Committee, E. C. Young, Purdue University, on or before February 1, 1950.
6. The prize awards committee will be made up of three persons, all of whom will be members of the American Farm Economic Association.
7. Announcement of the awards will be made on or before the time of the 1950 annual meeting of the American Farm Economic Association.
8. No paper shall receive more than one award but a published Doctor's thesis may be submitted in both classes.

WARREN C. WAITE, President
American Farm Economic Association

REPORT OF THE EDITOR

The new editor took over his duties beginning with the May 1949 issue. Every effort was made to continue the high standards maintained by the retiring editor. The following tabular data indicates the use made of the JOURNAL pages in 1949 as compared with 1948. (The Proceedings of the Annual Meeting held in 1948 and printed in February 1949 are included in the statistics for 1948.)

		1948	1949
Articles in regular issues		Number Pages	33 550
Notes in regular issues		Number Pages	23 137
Book Reviews in regular issues		Number Pages	30 67
News Items in regular issues		Pages	26
Papers in Proceedings		Number Pages	80 451
Discussion in Proceedings		Number Pages	24 82
Number of Different Authors in Regular Issues and Proceedings		177	168

The Executive Committee at its last meeting instructed the editor to keep the Proceedings issue within 400 pages and set a maximum of 1200 pages for the year. Since the editor was unable to keep the Proceedings within the designated number of pages, an attempt will be made to keep the regular issues down to 175 pages and yet print as many articles as before. The cooperation of the membership in submitting somewhat shorter articles will be appreciated.

WALTER W. WILCOX

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